



Quality Assurance Project Plan

S. H. Bell Company

Chicago, Illinois

Revision 1

(April 24, 2017)

Prepared for:

**S.H. Bell Company
10218 South Avenue O
Chicago, Illinois 60617**

Prepared by:

**Consolidated Analytical Systems, Inc.
201 S. Miami Avenue
Cleveland, OH 44115**



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CAS Project Manager

Approved by:

04/24/2017

Date

S.H. Bell Company Representative

April 24, 2017

Date

USEPA Region 5 Representative

Date

04-24-2017

Date

CAS Quality Assurance Project Officer

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D i s t r i b u t i o n L i s t

The following individuals have been provided for project

Table Intro 1 Distribution List for QAPP

Personnel	Organization	Email Address	Business Address	Telephone Number
John Bede	SH Bell Company	<u>Bell</u>	SH Bell Company Alpha Drive P O Box Pittsburgh PA	
James Langbehn	SH Bell Company	<u>Langbehn</u>	SH Bell Company South Avenue Chicago IL	
Nicole	USEPA Region 5	<u>Regan</u>	USEPA Region 5 Jackson Boulevard Chicago IL	
Scott Dismukes	Eckert Seamans Cherin Mellott	<u>sdis</u> <u>mukes</u> <u>mans</u> com LLC	Eckert Seamans Cherin Mellott LLC Franklin Street Floor Pittsburgh PA	
Meredith Cloran	Consolidated Analytical Systems	<u>cloran</u>	Consolidated Analytical Systems Inc Miami Avenue Cleveland Ohio	
Tomek Marchlewski	Consolidated Analytical Systems	<u>tmarch</u>	Consolidated Analytical Systems Miami Avenue Cleveland Ohio	

A P R O E C T M A N A E M E N T

This Quality Assurance Project Plan (QAPP) is implemented at the S H B e l l C o m p a n y Environmental Protection Agency (EPA) programs. This QAPP has been approved in accordance with the

EPA Guidance for Quality Assurance Project Plans (EPA 823-R-03-001) and the HUSE EPA Quality Assurance Project Plans for Environmental Data Operations (HUSE EPA 823-R-03-001).

The purpose of this document is to describe the sampling and monitoring data and the procedures used to ensure the quality of the data.

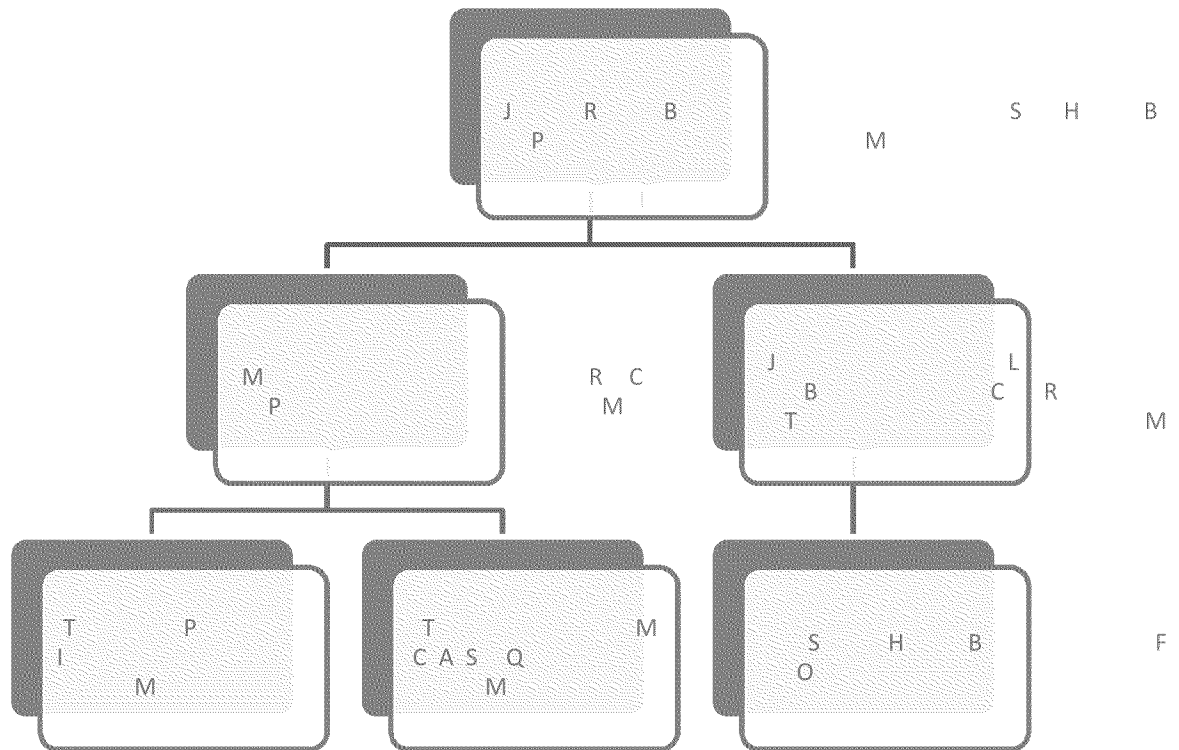
Following this format, the QAPP is organized into the following sections:

- **Section A – Project Management** – Provides a description of the organization and administrative functions of the project approach.
- **Section B – Measurement and Data Acquisition** – Provides a detailed description of all the elements of the monitoring system, including sampling, sample handling, analysis, calibration, and data management.
- **Section C – Assessment and Oversight** – Provides a description of the procedures that will be used to ensure the quality of the data employed in the project.
- **Section D – Data Validation and Usability** – Provides a description of the methods that will be used to validate and retain the data.
- **Section E – References** – Provides references to applicable method specific documents that are used to ensure the quality of the data.

A P R O E C T T A S K O R G A N I Z A T I O N

The organizational structure for the S H B e l l C o m p a n y Environmental Protection Agency (EPA) programs is shown in Figure A. The figure shows the key personnel involved in the CAS Project Manager, the S H B e l l C o m p a n y Environmental Protection Agency (EPA) programs, the Assurance Officer, and the Key personnel involved in the project.

Figure A 1. Project Organizational Chart



S.H. Bell Project Manager – The principal contact person for S.H. Bell Company, Chicago, Illinois. Responsibilities include:

- Provide direct oversight of the S.H. Bell Company, Chicago, Illinois facility
- Serve as USEPA's communication contact for the S.H. Bell Company, Chicago, Illinois facility
- Any changes to the scope of the project must be approved in writing by the S.H. Bell Company, Chicago, Illinois facility
- Review and submit monthly monitoring reports to the S.H. Bell Company, Chicago, Illinois facility

S.H. Bell Chicago, Illinois Terminal Manager – The S.H. Bell Chicago, Illinois Terminal Manager is Mr. James Langbehn. Responsibilities include the following:

- Provide oversight of monitoring activities at the S.H. Bell Chicago, Illinois facility
- Coordinate on-site record keeping activities and ensure monitoring system conditions and correct

- Report exceedences and corrective actions
- Maintain records of S H aBteildn oopfe rmat ti eorn unloading and processing I
- Notify USEPA of any barge undl oiardoinng opera
- Record observations of possiieble interfere

CAS Project Manager – Ms Meredith Cloran is the CAS Proj responsibilities include the following

- Communicate with S H Bell thæ eQrAsPuPr ea nt d h e notification of general corrective actions
- Oversee day to it iday priorj ælc urdoipnegri ænxs eucru itnigo nt h monitoring work and tracking the project bu
- Provide the primary leadership d o f o o h d i f A S i p with the contract laboratory
- Ensure QAPP objectives are mente n i s a c c o r d a n c e
- Develop and ensure QA QC procedures and Sta followed
- Report non confirming condit e c b h s e t a c s i o n s using appropriate documentation procedures
- Prepare monthly reports for USEHA Bell s

CAS Field Installation/Operations Manager – Mr Tom Platter is the C and Operations Manager Heensi s responsible fo

- Integrate and install the monitoring equipm
- Perform site set up and calibration
- Oversee performance of monthl ya unda it n s t e n a n c e
- Train field staff to coll eucdti nfgi eflidl t p e a r r s a n f e c t r e analysis I
- Assemble data records from flie æ l t d o n e o f n i v c a i l a n d measurement data
- Assemble data records from field technician

- Report non confirming conditions up to CASCP
- actions taken using appropriate documentation

CAS Quality Assurance Manager – Mr. Tomek Marchlewski is the
 He is responsible for the following tasks

- Oversee remote monitoring
- Perform data validation activities as needed
- Verify required QC activities are met as prescribed in this QAPP
- Verify data and flags from continuous monitoring
- Review laboratory analytical data packages
- Prepare report information in appropriate format
- Report non confirming conditions up to CASCP
- actions taken using appropriate documentation

S.H. Bell Field Operators – Several S.H. Bell employees provide
 described below. Each have been trained and certified by EPA
 and their activities are overseen by the S.H.

- Collect manual samples
- Record relevant field data

A Problem Definition and Background
 S.H. Bell has been asked to provide information to the
 Agency HUSEPA under Section 5 of the CAA. The
 I herein referred to as the RFI request for
 has submitted and USEPA Regional Administrator
 monitoring site locations for Federal PM_{2.5} and
 Federal Reference Method (FRM) PM_{2.5} with the
 direction monitoring. Per the request, the
 meteorological monitoring for the site is to be completed
 February. I and the EPA's Smith represent

Siting Plan to this AQ App for

Appendix D

In addition, the RFI requires the facility to measure and record the
 study period. The meteorological station is

facility as shown on Figure B. The site is equipped with the following meteorological measurements:

- Wind Speed
- Wind Direction
- Ambient Temperature
- Barometric Pressure

A. Project Task Description and Scope

This project is conducted to provide a firm quality assurance for the sites located around the S.H. Bell Chicago facility.

The monitoring stations in compliance with the following methods: PM monitors, data loggers, and field equipment as outlined in the Site Plan. The continuous HFEM I monitors are operated on a 24-hour basis. The FRM monitors are operated on a 24-hour basis.

Included as Appendix C is the filter-based monitoring system for both gravimetric analysis and detection of lead, chromium, manganese, nickel, and cobalt. The FRM/FEM laboratory methods are used to determine meteorological conditions. The site is equipped with a logger as five minute average data. The equipment is operating separately and will be integrated into the monitoring system. The meteorological data is collected by the equipment. The wind speed and wind direction are measured at the S.H. Bell facility. The temperature and barometric pressure are measured at the facility.

The commissioning of the parallel monitoring system is the first filter-based FRM sample data collection. The data is collected in accordance with the US EPA Appendix A. Deliverables for the project include the following:

This QAPP

Hourly data from each continuous monitoring system will be provided in ASCII comma delimited files and in a standard laboratory reporting format as provided to EPA.

Monthly data submittal of data will be provided to EPA within 10 days of the end of the monitoring period. See Section B for additional detail.

A Data Quality Objectives and Criteria

The EPA has developed a Data Quality Objectives and Criteria (DQO) process for environmental measurement projects. The DQO process is described in this QAPP and in the planning for this project. The DQO process is shown in Figure A. The DQO process identifies the data needed to make a decision and specifies a decision rule.

Following the DQO process for this project, those criteria are given in Table A. Accurate measurements of PM₁₀, carbon monoxide, lead, chromium, manganese, nickel, and cadmium measurements are patterned after the measurements published by EPA. HUSEPA.

A Special Training Certification

CAS Personnel assigned to the field installation operation will be trained in the use of the equipment to ensure correct data collection. The Manager will document the type of training required. This documentation will be kept in the CAS file for the Ohio facility. CAS Personnel have several years of experience and responsibility in air quality control and quality assurance.

Upon delivery and start up of the monitoring system, representatives including the Manager will be on site to ensure functionality and performance. The Manager will communicate with the S.H. Bell Company when needed.

A Documentation and Records

The dataset created for this meteorological program minimum of five years in the project database

- The hourly PM data from each FOFM then from monitors
- The laboratory analyses of mdmahi samples for gravimetric mass and select metals and
- The minute average wind speed and wind barometric pressure at the meteorological m

The following sources of information will support

- Station log books in hard copy and electronic
- Calibration and maintenance records for all
- Laboratory reports with quality control results
- Operational information collected internally
- Data validation and editing instructions
- QA audits of field operations and monitor p

Table A 1. DQO Process for S.H. Bell Company Chicago, IL Project

STEP	State	the Problem Scenario to be conducted at the time PM monitoring at four monitor filter based monitoring at one monitor site or off site. Whether or not any to the monitors. Additional provide speciation data for metals and
STEP	Identify	the Decision criteria and ambient air by predominant wind flow and potential speciation data will be used to assess PM sources
STEP	Identify the Decision	Measurements of PM concentrations as hour average wind Meteor direction ambient temperature be collected on a minute basis at the located in the central portion of samples will be obtained from two monitoring station. See Figure B
STEP	Define	the Study The sampling location identified in Section B of the QAPP document

STEP	Develop Rule	S.H. Bell Company will use the reported meteorological data to help assess background
STEP	Specific Decision	Calculations of the monitoring equipment specified in EPA guidance documents conform to guidance See Tables A
STEP	Optimize the Design	Improve the current equipment protocols S.H. Bell will bring into conformance

S.H. Bell's Chicago Monitoring Facility is a program including all monitoring equipment and contains a list of the records maintained. The electronic bound in notebooks and floor books. Electronic records will be stored and have documented Consolidated Analytical Systems and logs are Consolidated Analytical Systems and Project Management specific file

Table A 2. Documentation and Records Retention for S.H. Bell Company Chicago, IL Project

Documentation Type	Frequency	Responsible Person	Archive	Retention Period
Monitoring Data	Hourly Down BAM Periodic Lab Filter Based samples	CAS Data Manager	CAS Server backup Data Manager	5 years
High Volume PM filters	Monthly samples	Research Methods Inc	Lab Mounting Labs Inc	5 years
BAM Filter	Replaced as approximate monthly	Gasfield Installation Manager Project Manager	CAS facility Operation and CAS Manager	5 years
QAPP	Updated as	CAS Data Company	CAS	5 years
Copies of Logbooks	Filed the	CAS Installation Manager Project Manager	CAS Operation and CAS Manager	5 years
Data Reports	Monthly	CAS Company	CAS	5 years

Table A 3. Quality Criteria for Measurement Data

1. Measurements of PM₁₀ using EPA Federal Equivalent Method (FEM) Monitor (BAM 1020, EQPM 0798 122)	
Sensitivity	Lower Detection Limit hour average
Accuracy	Meets EPA Class III FEM Standard for additive flow rate measurement accuracy at
Range	g m
Completeness	sample capture for a 24 hour monitoring quarter with the exception of Acts power scheduling calibration audit events which neither S nor their monitoring contractor have control I
Cycle Time	One hour
2. Measurements of Metals using EPA Method IO 3.5 (ICP MS)	
Accuracy	for analytical results above
Precision	for analytical pairs above
Completeness	or by force majeure for a 24 hour monitoring quarter with the exception of Acts power scheduling calibration audit events which neither S nor their monitoring contractor have control I
3. Measurements of PM₁₀ using EPA Federal Reference Method (FRM) Sampler (Tisch Environmental TE 6070 DV BL, Federal Reference Number RFPS 0202 141)	
Accuracy	Flow rate measurement accuracy MUSEPA
Precision	N A
Completeness	sample capture for a 24 hour monitoring quarter with the exception of Acts power scheduling calibration audit events which neither S nor their monitoring contractor have control I
3. Measurements of Meteorological Parameters using weather instruments (Climatronics/MetOne Wind Speed, Wind Direction, Temperature, Barometric Pressure)	
System Accuracy	Typical
Precision	EPA methodology does not provide
Completeness	or by force majeure for a 24 hour monitoring quarter with the exception of Acts power scheduling calibration audit events which neither S nor their monitoring contractor have control I

As of the date of this QAPP, the meteorological data is being collected by the PMN until such time as it can be integrated into the CAS. The meteorological data is being collected by the PMN until such time as it can be integrated into the CAS.

B MEASUREMENT DATA ACQUI

B Sampling Process Design

S H Bell will establish monitoring system in accordance with the requirements detailed in USEPA of Section 106. Sampling methods, sample handling, analytical testing and calibration and data management will be in accordance with the following:

B Source Environment Description

S H Bell is Chicago's largest manufacturer of the city center in the Calumet River. The S H Bell facility is bordered to the west by the Calumet River above sea level and terrain is relatively flat.

The local land use categories include industrial, Calumet River, surrounding agricultural, river ports and canals are present.

The climate of the area is characterized by warm summers with occasional heavy rain and the average temperature in winter are uncommon.

The annual average snowfall is about the same. The proximity to the effects year round. Annually, the southwest to northeast. See Figure B.

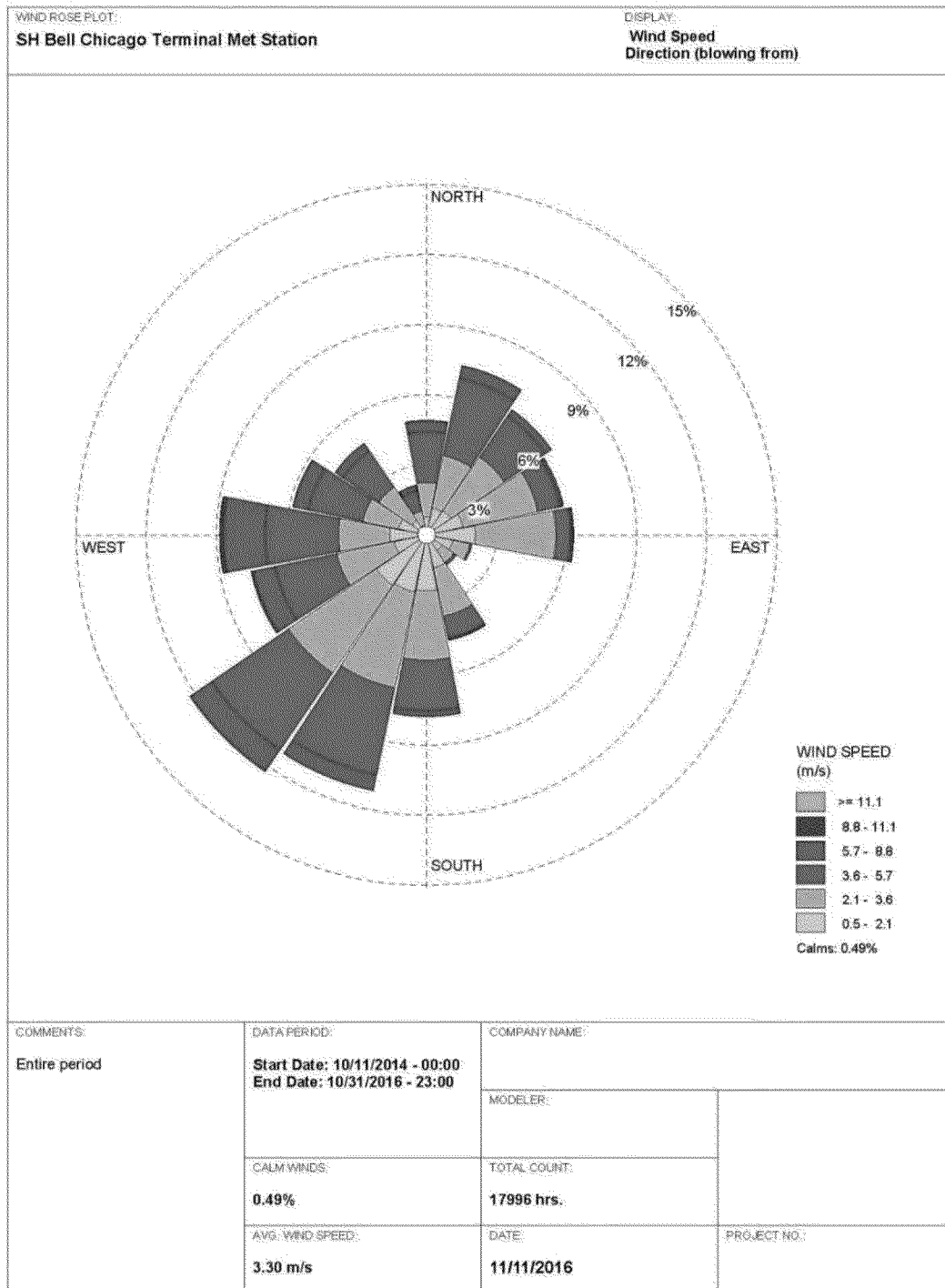
B Monitor Site Description

Figure B shows the location of the monitoring program. The yellow outline shows the historical wind rose plot for the monitoring network configuration by site.

Figure B 1: Monitoring Site Locations for the S.H. Bell Chicago Facility



Figure B 2: Historical Wind Rose Data (October 2014 thru October 2016) for S.H. Bell Chicago Facility



B Sampling Methods Requirements
 Sample collection methods as samples data in the control requirements that are applied to the have been identified for the purposes of the manuals are kept on site at the S.H. Bell Company and S. Electronic copies of the manuals maintained at CAS's Cleves Ohio facility

Table B 1. S.H. Bell Monitoring Network Configuration by Site

Monitoring Site ID	Approximate Location		Monitoring Equipment
	Northing	Easting	
S			BAM monitor
S			BAM monitor
S			BAM monitor Agilaire Data logger
S			BAM monitor Two H. I. Tisch Environment BL Filter PMA Modifiers
EMS Existing Monitoring Station I			Speed Wind Direction Pressure Data Logger Meteorology

B Sample Collection Methods

BAM 1020 FEM PM₁₀

The PM continuous monitors sample ambient size selective inlet that has a dynamic diameter to pass through to the measuring tape. Instruments Model BAM 1020 FEM PM₁₀ is used.

At the beginning of each sample, the source of high energy electrons is used. These beta rays are detected by a zero reading. The BAM on the sample head has a vacuum pump pulls a measured amount of air through the tape loading it with ambient dust. The tape is then moved back between the beta source and the detector to measure the ray signal which is used to determine the final concentration.

This mass is used to calculate the air flow rate through the filter.

Specifications for the BAM operation and maintenance requirements of the BAM Unit are:

BAM Particulate Monitor Operation Method

A hard copy of the BAM monitor manual and a hard copy of the BAM maintenance manual are to be maintained at the monitoring site. An electronic copy of the manual is to be maintained in the folder of the SH Bell client's computer in the approximately meters with the monitor.

Table B 2. BAM 1020 Specification

Parameter	Specification
Range	g m ⁻³
Sensitivity Std Deviation	hr ⁻¹
Flow Rate	liters minute ⁻¹
Beta Source	Carbon Ci
Operating Temperature	to C
Humidity Control	Active control inlet set point
Analog Output	VDC std select current ranges
Memory	days record hour

*Operating temperature inside the equipment shelter

Tisch Environmental HiVol 6070 DV BL Filter Based FRM PM10

The Tisch Environmental HiVol PM10 sampler draws air samples through a size selective inlet and aerodynamic diameter separator to the measurement chamber. The Tisch Environmental Model HiVol 6070 DV BL are provided in Table B.2. The operation and maintenance of the HiVol 6070 DV BL are provided in the Tisch Environmental Instrumental Manual for Series PM10 High Volume Air Sampler. The Tisch Environmental Manual is kept on site at the monitoring site. In addition, a hard copy of the manual is to be maintained in the folder of the SH Bell client's computer in the approximately meters with the monitor. The sample inlet height will be approximately

Parameter	Specification
Particle Size	PM
Flow Range	cubic feet
Filter Size	x
Federal Reference Method	REFS Method
Flow Control	Volumetric
Motor Type	Brushless
Timer	Digital day

[illegible]

Each meteorological monitor isg gwei rredwi itnht o a a n
interface module at the meteo r p r l o g g r i a c m a l f o t r o w t e l
meteorological equipment is Ingg gteor Weert rem o Me et
collection archiving and b y r e s p o r t i n g B w e i l l b
archived and edited as necess m e t y e o r o l R e p o r t s
including wind speed and w e l l h e o p e r f g r o
Semi annual calibrations of m t w i e l m e h e o p e r f g r o
Murray and Trettel Inc N l s S e t d t u r r a i c n e g a b d æ l i t
Wind speed sensors will be s w a p p o e n d t h a s n d b e W i r n d g
sensors will be swapped and b C e o a m p i l n e g t s e d r e c p a l l a i c b e r d a
will be provided to S H B e l l

Table B 4. Meteorological System Components

Components	Climatronics/MetOne* Part Number)
Wind Speed Sensor	or H I S
Wind Direction	H I
Platinum Temperature Probe	T
Six Plate Radiation Shield	
Barometric Pressure Sensor	
Cross arm	
External Heaters	
Heater AC Cable	
Wind Cable	
Data Logger in Enclosure	
Battery Back Up Power Supply	
AC Surge Protector	
Signal Line Surge Protector	
Network Link Interface	CNL
Windows Data Logger Software	LOER NET
Tower Kit	
Full Height rounding Kit	

*Denotes MetOne part number mbAelrls others are Climatronics

Additional measurements of ambient air temperature and relative humidity from each BAM unit using ambient air data sensor flow rates for PM monitoring EPA Sgms is also provided

Shelters

Temperature controlled shelter with high insulation and R value will be installed at each of the four sites equipped with a commercial grade air conditioning unit that exceeds National Electrical Code with HACR example enclosure through which the BAM air flow to the monitoring unit BAM temperature pressure data signal cable

Data Systems and Software

The BAM units have on board data logger and diagnostic information and vision as a software to communicate with the BAM units

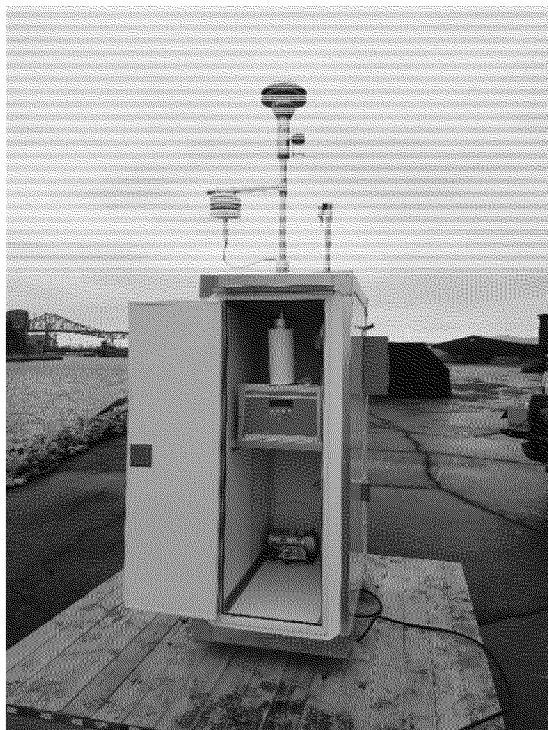
An Agilaire Model data logger is also available other three monitoring systems store data from the BAM FEM monitoring unit The data is communicated from the other remote radiometers

Agilair data logger. Agilair provides an overview of the monitoring system. Each meteorological monitor is connected to a data interface module at the meteorological equipment. The meteorological equipment is LoggerNet.

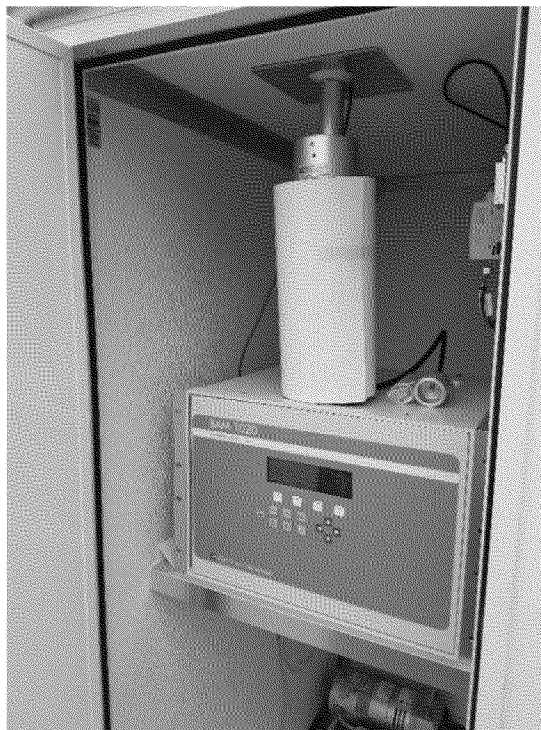
Access to Monitoring Sites

In the event of a natural or man-made event, access to the monitoring sites will be suspended until it is safe to access the sites. A record of the event will be maintained in the site logbook and electronic data files.

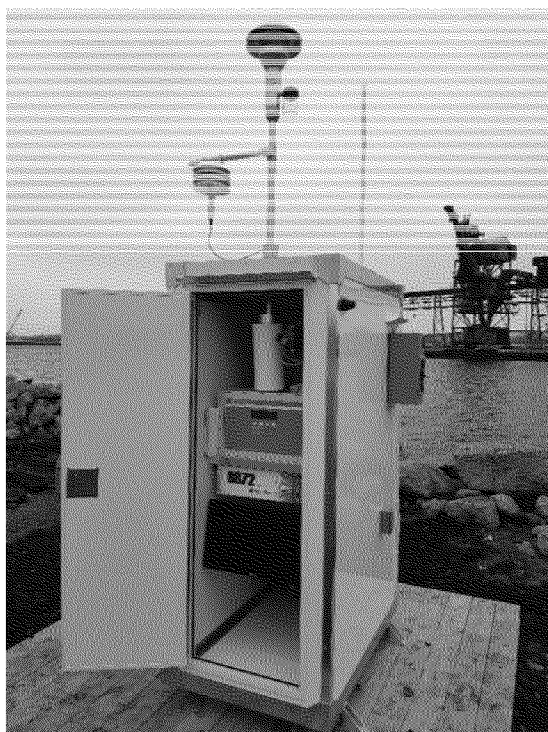
Figure B 3. Overview of Shelter Configurations



S1 (Monitoring Site 1)



S2 (Monitoring Site 2)



S3 (Monitoring Site 3)



S4 (Monitoring Site 4)

All datalogger monitor wand sampler scientist technician's reference time work ka iamedd cfhrecnk ad once every days Instrument clock shall be reset to within Recos will be recorded in the appropriate time of day

B Sample Documentation and Control

Field operation records include the following: continuous monitor calibration records flow verification records in electronic form as a minimum least monthly to the CAS project manager for data polling systems for the CAS team members have access to the data in Appendix A and an exemplar of the data in Appendix B. The chain of custody for the samples is described in Volume II of the EPA QA Handbook and is handled in each applicable analytical method.

B Analytical Methods Requirements

The monitoring program will collect the following: Environmental High Volume Filterable Particulate Matter (PM₁₀) gravimetric analysis and determination of lead, cadmium, and nickel on a scheduled basis. CAS will operate two HVMs at the monitoring site. These samples will be collected every day according to USEPA's daily sampling schedule is included as Appendix C of the QA Manual. The filterable particulate matter is collected on a 47mm Whatman 41-200 filter. The filter is then placed in a clean container and sealed. The filter is then shipped to Inter Mountain Labs, Inc. in Salt Lake City, Utah. The filter is then analyzed for lead, cadmium, and nickel. The results are then reported to the CAS. The chain of custody for the samples is maintained throughout the process. Copies of completed Chain of Custody forms are archived in the electronic file system for the CAS for a minimum of one year.

Inter Mountain Labs, Inc. will analyze the samples for lead, cadmium, and nickel using USEPA Method 8000.

The mass concentration is determined by gravimetric analysis. The measurement agreement with the BAM of the SO₂ Chicago facility's four monitoring sites is within ±5%. Following gravimetric analysis, the extracted cadmium, chromium, manganese, and nickel are analyzed using microwave or hot acid digestion. The HICP MS I Inter Mountaineers in accordance with USEPA's Inorganic Compounds Method 10. The laboratory performs the determination of USEPA's Inorganic Compounds Method 10. The detection limit for each of the target metals is listed in Table B.5.

Table B 5. Estimated Method Detection Limits for Target Metals

Metal	Method Detection Limit (in ng/m ³)
Arsenic	
Cadmium	
Chromium	
Lead	
Manganese	
Nickel	
Vanadium	

ng/m³ = nanograms per cubic meter

Laboratory records include field notes, sample chain of custody forms, match file, QA/QC check data, analysis results, and a database. The laboratory records are maintained in an archival of records is accomplished by ensuring that the lab receives field data and sample management task leader as a condition of the contract.

An important consideration of the field data is the concentrations near the method detection limit. The detection limit is defined as the concentration within its SD. The Reporting Limit (RL) is typically five times the detection limit. The RL is typically five times the detection limit. The concentration range between the RL and the detection limit is typically five times the detection limit. The specifications are applicable to the measurement.

concentration data are possibly a result of the data being collected accordingly by data users. The data being reported by the volume can vary slightly from as reported to the actual volume.

In accordance with Appendix B, the data will be collected from the PM filter based on the instructions from the PM filter manufacturer. The data will be archived stored at the CAS facility in Cleveland.

B Quality Control Requirements

The quality control (QC) procedures are described in this section. The QC procedures are described in Section B.

B Field Quality Control

Field quality control encompasses the procedures that the technician to promote quality of the data.

Documentation

The operator will maintain a field notebook and field data maintenance logs. The operator will keep the monitoring equipment in good condition. The stations HS, S, S, and S will be forwarded to the team at least monthly. The data will be presented in Appendix A.

PM10 Continuous Monitor Checks (BAM 1020)

Monthly leak check, quarterly flow rate checks, and yearly hour zero checks will be performed. The checks and flow or temperature and pressure are maintained as recommended in the maintenance manual. The checks are listed on the monthly QC report. The data will be presented in Appendix A.

High Volume PM10 Monitor Checks (TE 6070 DV BL)

Appendix B includes a sample High Volume PM10 Monitor Checks. The Field Envelope for the contract high volume PM10 monitor determination of lead and toxic metals will be performed. The data will be presented in Appendix A.

Meteorological Equipment Checks

The ambient temperature and barometric pressure sensors are traceable to the National Institute of Standards and Technology (NIST) meteorological system calibration. The temperature and pressure sensors for the BAM are also traceable to NIST and pressure readings are certified to be accurate. The BAM service checks is provided in the BAM manual. All H

- The shelter must protect the inhabitants from dust and dirt provide third windage soundings of Occupational Safety and Health Administration to prevent a buildup of dust
- The shelter must protect the inhabitants from vibration corrosive chemicals intense

The following lists present some of the equipment and methods for each type of analysis. Specific laboratory SOP documents kept at the Interline Mountain Air

Gravimetric Analyses

Laboratory quality control procedures for Arsenic by MS E h
 IO includes the following

- Use media that meet the requirements for s
 IO Section
- Equilibrate media under the temperature and
 of the Method before weighing
- Use the same microbalance for pre and po
- Calibrate the microbalance using Class S s
- After every tenth weighing standard weight c
- Reweigh of the samples using a differ

Metals Analyses

Laboratory quality control procedures for Metals
 IO includes the following

- Use at least two calibration standards for m
 initial calibration
- While performing calibration verification
 from a different vendor
- Analyze a calibration blank before each ru
- Run interference check standards though th
- Use continuing calibration standards not ch
 required depending on the number of filt
- A reagent blank should be tested
- Laboratory control spikes should be used a
- Analyze a matrix spike during each run
- Test a duplicate or spike replicate after

Sample Naming Convention

CAS will be using the following sample naming identification HID I designation for the ash monitoring study Sample naming format identified

AA BBB MMDDYY V

Where

- **AA** is the collection location Site for a Site
- **BBB** is the instrument HV for High Volume Sampler
- **MMDDYY** is the sample month day and year
- **V** is the type of sample Random sample

For example S HV ed on R Maerpcrhe sent s High Volume Sampler at Monitoring Site

B Equipment Testing Inspection

Specific tasks for periodic testing required for sampling and monitoring equipment to provide the manufacturer's operation project quality assurance Initial system integration testing and sample performance at the CAS facility to include setup tasks operational checks and compliance with the particulate monitoring standards as summarized for each type of equipment to be used site visit logbook kept at each site operations task leader should provide checks to technician Common consignment of parts and materials at the S H Bell Chicago facility to the CAS facility in Cleveland Ohio Less common equipment for delivery to site via common carrier

PM10 Continuous Monitor Maintenance (BAM 1020)

Each BAM PM monitor requires by the manufacturer Instrument Manual Beate Chicago sites and detail the required periodic maintenance manual I To assure proper maintenance schedule must be followed and operator must be

identified decrease in instrument performance requires the following maintenance

- nozzle and vane cleaning
- leak check
- one point flow system check
- capstan shaft and pinch roller tire cleaning
- PM inlet particle trap cleaning
- inspection of filter tape
- checking error logs
- checking real time clock

High Volume PM10 Maintenance (TE 6070 DV BL)

Maintenance of the High Volume PM be performed in accordance with the procedures in the High Volume Maintenance Section I. Manufacturer's instructions items refer to Sampler Operation and Section tasks for

- inspection of all gaskets and seals
- inspection of filter screen and removal of
- inspection of filter media holder
- inspect elapsed time indicator
- clean any excess dirt

Additional quarterly maintenance includes

- cleaning of the inlet and motor housing gas

Meteorological System Maintenance

The operator must perform maintenance activities and inspect the functionality of the wind vane and anemometer aspirator shield fin set. If the fastening hardware should be conducted with the system calibration or audit

B Acceptance Requirements for
 Instrument spare parts replacement criteria shall be based on the original equipment manufacturer's specifications. Equipment materials vendor shall be approved by the HBA. Commonly available HBA equipment and/or consumables associated with the PM shall be used.

B Instrument Calibration and Frequency
 This section describes the calibration and frequency measurement conducted in the S.H. Bell PM.

B Calibration Requirements
HBA

Each HBA unit deployed on the field shall have a Certificate of Calibration and a flow check record for each of the monitoring sites.

During the first quarterly maintenance backflow test, the zero calibration shall be performed in place of the PM sample collection procedure. Completion of the BDK shall be required for subsequent BDK tests are performed on a regular basis but not less frequently than every month.

Annual Three Point Flow System Calibration shall be performed on reference flow meter and must be performed on each unit. Each flow calibration check shall include cleaning final leak check and three leak tests required. Refer to Manual Sections.

The Filter Relative Humidity Test shall be performed annually on the instrument should be performed annually on the instrument.

Additional checks include the background check, span foil leak check and should be performed on the instrument.

Factory recalibration is required for the instrument.

B Calibration Requirements for DV BL I

Flow Verification Calibration of the TE initial installation then quarterly and after any modification.

The TE is the preferred method as it simulates change in the resistance by a continuous infinite resolution lets the test technician see the calibration kit includes a plastic tube with a TE orifice with a flow rate of 100 cfm at five points of which three must be within 10% of the design flow rate.

After calibration the calibrator flow rate within 10% of the design flow rate. Refer to the Manual DV complete calibration procedure requiring the following steps:

B Calibration Procedures for Meteorological Sensors

Meteorological sensors are calibrated not less frequently than annually in accordance with the manufacturer's instructions. All calibrations will be performed by a qualified person.

B Data Acquisition Requirements

The BAM instruments provide a signal to the acquisition system via radio modem where the engineering units and stored in the database by the Agilair database system. The data is then transferred to the AirVision server housed at the CAS facility.

Data collected from the BAM instruments will be subject to visual inspection of the data. If the data is found to be outside of the prescribed limits, the data will be reviewed and corrections made. The results will be reported as soon as possible and action determined if a special site visit is required.

Table B 6. Critical Criteria for PM10 Monitoring

Requirement	Frequency	Acceptance Criteria	Reference	Action
PM10 Continuous (BAM 1020)				
Sampling	Period of hours of operation	Every minute midnight to midnight standard	CFR 40.101 to local time	Verify prior to sampling
One Point Rate Verification	Flow rate	Transfer standard	CFR 40.101 and A	Verify values outside acceptable criteria a leak check flow Method Table
PM10 Filter Based (TE 6070 DV BL)				
Sampling	Period	All filters midnight to midnight standard	CFR 40.101 to local time	Verify prior to sampling
One Point Rate Verification	Flow rate	Transfer standard from design	CFR 40.101 and A	Verify values outside acceptable criteria a inspect flow Method Table

Table B 7. Operational Criteria for PM10 Monitoring

Requirement	Frequency	Acceptance Criteria	Reference	Action
PM10 Continuous (BAM 1020)				
System Leak	Check of beginning sampling month	Within 5% of design flow rate	Method 101, EPA 821-G-03-001	Check Vacuum line pump Inspect Nozzle
Multi Point Verification	Flow rate of following startup	Rate of flow points of design	Cal CFR 101, EPA 821-G-03-001	Check values outside acceptance criteria check recheck
Semi Annual Audit	Flow rate	Rate of flow points of design	Cal CFR 101, EPA 821-G-03-001	Check Vacuum line pump Inspect Nozzle
Inlet Down Tube Cleaning	months	Clean	Method	
PM10 Filter Based (TE 6070 DV BL)				
Multi point Verification	Flow rate of design	Rate of flow points of design	Method 101, EPA 821-G-03-001	Check values outside acceptance criteria consult manufacturer's manual
Field Temp Verification	Installation	Recommendation		
Semi Annual Audit	Flow rate	Rate of flow points of design	Method 101, EPA 821-G-03-001	Check values outside acceptance criteria consult manufacturer's manual
Maintenance Impactor Plate	of month	Clean grease	Manufacturer recommendation	
Manufacture Recommended Maintenance	per manufacturer SOP	per manufacturer SOP	NA	

Table B 8. Systematic Criteria for PM10 Monitoring

Requirement	Frequency	Acceptance Criteria	Reference	Action
PM10 Continuous (BAM 1020)				
Sampler Monitor		NA requirement listed in FRM FEM designation	Me 4 CFR Part Apps C Section NA ARM CFR Part FRM FEM method list	
Siting		year criteria waiver document	Me 4 CFR Part App E sections Recommendation CFR Part App E sections	
Data Completeness	quarterly	hourly	Recommendation CFR Part App K sec	
Reporting Units		agl m fi standard temperature and pressure HSTP I	CFR Part App K	
Verification/Calibration Standards and Recertification		All standards should have multi point certifications against NIST Traceable standards		
Flow Rate Transfer		Std traceable	yr and Pa Std	CFR Part App sec
Field Thermometer		yr resolution	and section C accuracy	Method
Field Barometer		yr resolution mm Hg accuracy	and section	mm Hg Method
Clock timer Verification	mo		min day sec	and I

Table B 8. Systematic Criteria for PM10 Monitoring (Continued)

Requirement	Frequency	Acceptance Criteria	Reference	Action
PM10 Filter Based (TE 6070 DV BL)				
Sampler Monitor		NA requirement listed in FRM FEM designation	Me 4 CFR Part Apps C NA ARM CFR Part FRM FEM list	Part Section Part method
Siting		year criteria waiver document	Me 4 CFR Part App E Recommendation CFR Part App E	Part sections Part sections
Data Completeness		quarterly	Part sec	App K c
Reporting Units		all filters and standard temperature and pressure	Part CFR	App K sec
Precision				
Single analyzer		Coefficient of variation g m	Me 4 CFR Part HC V Recommendation	I
Single analyzer		yr g m	Ca Vn d Recommendation	I
Verification/Calibration Standards and Recertification		All stds should have multi point certifications against NIST Traceable stds		
Flow Rate Transfer		Std traceable	yr CFR Part App 4 Method	Part Sec of NIST
Field Thermometer		yr resolution	and Sec C accuracy	I Method
Field Barometer		yr resolution mm Hg accuracy	and Sec	mm Hg Method
Clock timer Verification	year	min mo		recommendation

B Data Management

The proper management of all data is a critical aspect of monitoring results. As such, the proper recording, storage, acquisition, validation, reduction, and reporting of monitoring data will be recorded and maintained in a dedicated logger. PM data will be reviewed and transferred to the CAS AirVision file server and added to the computer having the correct software and database.

All electronic calculations and data storage shall be done in Microsoft Excel. All Air Vision data and the dedicated logger. All project documents are to be stored for a minimum of 5 years following project completion. Consistent with Analytical Systems which are obtained and maintained.

PM data will be reviewed and reported to the CAS Data Manager reports. The data shall be provided to several levels of quality assurance and validation. Validated data are to be prepared for final data consolidation and storage in the Analytical Systems server and then archived in a secure location for protection.

The Data Manager will archive data to a secure location on secured servers which are backed up nightly. The BAM filter tape will be collected from the site at least every 6 months. The filter tape shall be stored in their facility in Sheridan, Wyoming.

PM10 Continuous Monitor (BAM 1020) Data Reporting

The PM hourly concentration is reported on a minimum basis in accordance with the USEPA Appendix B. The data within the 1-hour period of the continuous data collected March 1.

High Volume PM10 (TE 6070 DV BL) Data Reporting

Reporting of the data from the PM gravimetric analysis and determination of the data shall be reported in the HUSHA format submitted to the contract laboratory.

Below is an example timeline depicting the process based samples. Please note that samples are collected on days. He g if the sample is not collected until Monday morning based on Hour Bell

- Days Samples are collected with the USEPA day sampling schedule Appendix
- Day On the first business day, two samples are collected from S HV
- Day Samples are shipped to the laboratory
- Day Transport to laboratory
- Day Laboratory check in
- Day Filter conditioning
- Day ICP MS analysis
- Day Report preparation by the laboratory
- Day CAS receipt and review and
- Day Reporting

Note Date the data is collected with the following month

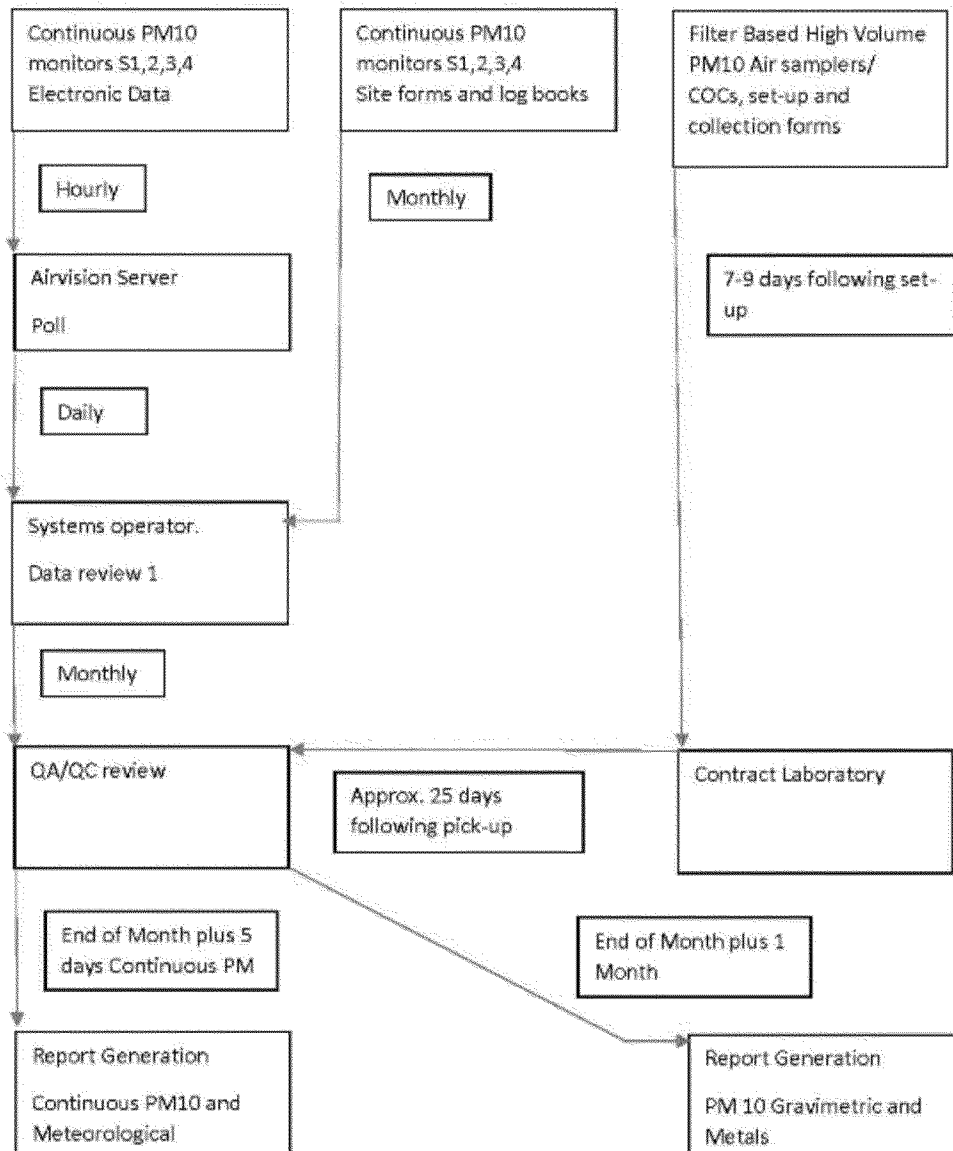
The appropriate reporting submittal schedule is

- April Continuous PM data
- May High Volume PM data
- May Continuous PM data
- June High Volume PM data
- June Continuous PM data
- June High Volume PM data

Data may also be marked with the appropriate code if necessary

Figure B presents the data and flow diagram generated in the network

Figure B 4. Data Management Tasks for S.H. Bell Chicago Monitoring Network



C A S S E S S M E N T A N D O V E R S I

C A s s e s s m e n t a n d R e s p o n s e A c t i o n

The project team includes a qualified representative and independent assessment of the management performance of the same corporate organization during the project. Assessments conducted for the project are based on the degree to which the procedure and performance evaluations are acceptable results. Both data collection efforts as audits are conducted following the Handbook series Volumes I, II, and IV.

C T e c h n i c a l S y s t e m s A u d i t s

Technical Systems Audits are performed on equipment are functioning as intended. The audit includes examination of facilities, equipment, and data management. The audit is performed using a checklist as a guide and the audit results are reported in the EPA QA Handbook series H.

From this assessment, the audit results are compared to the specifications relating to the quality of the data. The audit includes traceability documentation for the quality control checks on the data. The audit results are compared to the specification appears in the EPA QA Handbook series H. The audit results are compared to the guidance document information on the monitoring activity. The audit results are compared to the EPA QA Handbook series H.

Figure C 1. Example TSA Checklist for BAM 1020



BAM-1020 Audit Report

Customer	
Instrument	
ID/Serial No.	

Audit Performed by	
Date	
Location	

Flow Audits

Standard Used	Model	Serial Number	Calibration Date
Flow Reference Standard			
Temperature Standard			
Barometric Pressure Standard			

	<i>as found</i>	<i>as left</i>
Leak Check Value		

	<i>as found</i>		<i>as left</i>		N/A
	BAM	Ref. Std.	BAM	Ref. Std.	
Ambient Temperature					
Barometric Pressure					
Flow Rate (Actual Volumetric)					
Flow Rate (EPA Standard)					

Mechanical Audits

Note: Mark as found and/or as left box to reflect actions performed.

	<i>as found</i>	<i>as left</i>	
Pump muffler unclogged			
Sample nozzle clean			
Tape support vane clean			
Capstan shaft clean			
Rubber pinch rollers clean			
Chassis ground wire installed			N/A
PM10 particle trap clean			
PM10 drip jar empty			
PM10 bug screen clear			
PM2.5 particle trap clean			
Inlet tube water-tight seal OK			
Inlet tube perpendicular to BAM			

Figure C 1. (continued)



BAM-1020 Audit Report

Setup and Calibration Values

Parameter	Expected	Found
Clock Time/Date		
RS-232 Baud Rate	9600	
STATION #		
RANGE (mg)	0 - 1,000 mg	
BAM SAMPLE		
MET SAMPLE		
OFFSET		
CONC UNITS	mg/m3	
COUNT TIME (min)		
FLOW RATE		
CONC TYPE	STD	
FLOW TYPE	Actual	
Cv		
Qo		
ABS		
μ sw		
K Factor		
BKGD		
STD TEMP (°C)	-40 °C to 55 °C	
HEATER	Auto	
e1		
Errors	N/A	
AP		
FR1		
FRh		
Password	f1 f2 f3 f4	
Cycle Mode	Standard	
RH Control	yes	
RH Setpoint (%)		
Datalog RH	yes	
Delta-T Control	no	
Delta-T Setpoint (°C)		
Datalog Delta-T	no	

Figure C 1. (continued)



BAM-1020 Audit Report

Analog Voltage Output Audit

 Relevant? ☐ Yes ☒ No

DAC Test Screen	BAM Voltage Output (Volts)	Logger Voltage Input (Volts)
0.000 Volts		
0.500 Volts		
1.000 Volts		

Membrane Audit

LAST m (mg)	
ABS (mg)	
Difference (mg)	0
% Difference	#DIV/0!

Flow Control Range

Flow Setpoint	BAM Flow
15.0 LPM	
16.7 LPM	
18.4 LPM	

Last Six Errors in BAM-1020 Error Log

Error	Date	Time
1		
2		
3		
4		
5		
6		

Notes

Recommendations

Signatures

Date

Service Technician		
Reviewer		

C Performance Evaluation Audit

Continuous PM monitor and FRMs are placed at the flow rate measurement accuracy and pressure transducer measurement accuracy. For continuous Performance audits for meteorological conditions, an audit standard for the wind sensor will be turned to a series of known reference points with respect to true north. The ambient temperature and barometric pressure are recorded at the audit standards if a digital barometer is used. The temperature and a traceable pressure sensor are used.

C QAPP Revisions

If revisions to the S.H. Bell Company QAPP will be approved by S.H. Bell Company review comment and a revised distribution list presented to the S.H. Bell Company responsible for QAPP revision and distribution.

C Reports to Management

Reports for field performance and test results of the audit summary prepared for the findings related to the standard compliance for each audit standard employed by the technician and or the operator. Significant deficiencies are identified during a debriefing of the audit. If significant deficiencies are identified during the audit, the CAS Project Manager will notify S.H. Bell Company. The project team will notify S.H. Bell Company of the project team within two weeks of completion of action items. The audit results are classified as open pending investigation. If a specification is being met to EPA's reporting effort.

The designated project team will follow recommendations and provide a written summary of the outcome of the corrective action. The project Manager for the field network is responsible for inadequate. He must communicate the situation.

Accuracy, precision, and completeness are the three quality assurance criteria applicable per the quality assurance plan. The laboratory detection limits are the nominal values stated in this QA Plan. The accuracy are as described in Volume I of the EPA Method 1631, and the precision are as described in EPA Method 1631, respectively.

Precision of PM measurement is determined by least squares regression analysis of pairs of samples at S.H. Bell Company Laboratory analysis precision is determined by duplicate analyses.

Completeness is calculated as the ratio of the total planned number of samples to the number of samples expressed as a percentage.

Accuracy data are generated by the analytical method audits. Precision data are generated by the analytical method created from precision check samples. The data are generated by the analytical method by the analytical method by the analytical method staff using an automated data management system.

DATA VALIDATION AND USE

Data Review Validation and

Data review validation will be performed on all types of data are collected from manual samplers and sensors. Collected data will be reviewed for responsibility of the data manager and staff. The task leader will always be responsible for delegates and supervises them.

In the event the daily data reviewer does not notify the Project Manager, data will be flagged. The data editor will gather data of interest and reports to the Project Manager. This typically occurs with the Project Manager. If the data are valid, the Project Manager will be notified. Meteorological data so that the data could have contributed to the result of interest.

Analytical laboratory reported data will be loaded into the data base. The data are properly loaded and the data are properly loaded.

Data will be declared invalid if the monitor, sampler, or meteorological conditions or was malfunctioning. Measurements can be verified by the identification of the affected data files. The supporting documentation of the data will be reviewed and justified.

Data validation will be performed by the management task leader. The task leader will monitor data and the meteorological data will initiate the validation process.

All continuously generated data will be transmitted via cellular modem during the validation process. The data involved in validation of the data in general.

- Reviewing all site visit logs to determine if there is any information for indications of unusual or inconsistent maintenance calibration events
- Reviewing each laboratory report
- Reviewing all available BAM data to determine if there are any performance issues
- Examining the continuous PM data to determine if there are any unusual persistence of high values that seem incongruous with normal measurements

Any Suspect data is flagged and reviewed to determine if it is invalidated. The cause of the suspect data is determined and the results from all quality control and data quality objectives are reviewed. Evidence of bias, external influences on the data, or other factors that may affect the measurement data may be identified for the data.

After the edit and validation process is complete, the data manager will be responsible for the distribution of the data and peer reviewed to ensure that the data is accurate. The edit process was consistent with the project requirements. The edit instructions is retained and a report of the edit is reported to the client.

D Reconciliation with Data Quality

Periodically the project programs goals and data collection efforts. This annual data collection will be reviewed the performance of the QAPP and the limitations of the data.

D Assessment of Measurement Performance

As part of the annual review, the project will determine if the requirements of the regulatory program are being met. Key indicators relating to the performance of the measurement system, comparability goals for the data, and the accuracy of precision and accuracy of the data set. These measures will be used to determine if the data is accurate.

If any of the data quality issues arise, the project team will conduct an audit outside the project goal. The data is not to be used in the project team to determine the impact of the data quality issues on the project team and ultimately how the issues impact the fit of the project.

Any potential limitations not identified during the project team will present additional opportunities for submission and will clearly define the methodology used for a particular conclusion or decision.

E R E F E R E N C E S

Met One BAM 1020 Particulate Monitor Operations Manual, BAM 1020 9800, Rev H Met One
 Instruments Inc rants Pass OR

S H B e l l C o R e s p o n s e t o R e q u e s t t o P r o v i d e I n f o r m a t i o n P u r s u a n t t o t h e C l e a n A i r
 Act, Appendix B, PM10 Monitors and Siting, Proposed Monitoring Sites and Locations", January 4, 2017.

H M o n i t o r A m e n d m e n t s P a d r e v i s i o n s a s n o t e d b e l o w :

- 01/11/2017 – USEPA Region 5 Email from Nicole Cantello "S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting" (request for clarification to proposed monitoring site selection)
- 01/18/2017 – S.H. Bell Letter "Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection"
- 01/25/2017 – Conference Call between USEPA Region 5 and S.H. Bell (request for evaluation of PS2, PS2.1, PS2.2, and PS2.3)
- 01/30/2017 – S.H. Bell S. Letter Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection (Response to 01/25/2017 conference call requesting written evaluation of PS2, PS2.1, PS2.2, PS2.3)
- 02/02/2017 – Conference Call between USEPA Region 5, the City of Chicago, S.H. Bell, Eckert Seamans Cherin & Mellot, LLC and Consolidated Analytical Systems, Inc. (request to re evaluated alternative proposed monitoring site PS2.2)
- 02/06/2017 – S.H. Bell Letter "Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection" (Re Evaluation of alternative proposed site PS2.2)
- 02/07/2017 USEPA Region 5 Email from Nicole Cantello "S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting" (request to locate proposed monitoring site PS2.2)
- 02/10/2017 – S.H. Bell Letter "Response to February 7, 2017 Email Request to Locate Proposed Monitoring Site PS2.2"
- 02/13/2017 – USEPA Region 5 Email from Nicole Cantello "S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting" (request to resubmit S.H. Bell siting plan for approval)
- 02/24/2017 USEPA Region 5 Email from Nicole Cantello "S.H. Bell Company Chicago S. Avenue O Terminal QAAP" (providing links to be researched in the development of the site specific QAPP)
- 03/02/2017 USEPA Region 5 Email from Nicole Cantello "S.H. Bell Company Chicago S. Avenue O Terminal – Monitoring and Siting" (approval of the S.H. Bell Siting Plan)
- 03/10/2017 – S.H. Bell Letter "Letter Updates to S.H. Bell's December 30, 2016 Response to: Request to Provide Information Pursuant to the Clean Air Act Appendix B, PM10 Monitors and Siting Proposed Monitoring Sites and Locations"

H T i s c h E n v i r o n m e n t a l O P E R A T I O N S M A N U A L , I T E M 6 0 0 0 S e r i e s T E 6 0 7 0 , T E 6 0 7 0 B L , T E
 6070D, TE 6070D BL TE 6070V, TE 6070V BL, TE 6070DV, TE 6070DV BL, PM10, Particulate Matter
 10 Microns and less High Volume Air Sampler, U.S. EPA Federal Reference Number RFPS 0202 141"

T i s c h E n v i r o n m e n t a l I n c V i l l a g e o f C l e v e s

H U S E P A I U n i t e d Q u a l i t y A s s u r a n c e H a n d b o o k f o r m e n t a l
 Air Pollution Measurement Systems, Volume 1 A Field Guide to Environmental Quality Assurance
 E P A R a A p r i l

H U S E P A a I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 D e v e l o p m e n t C o m p e n d i u m o f M e t h o d s f o r t h e D e t e r m i n a t i o n o f I n o r g a n i c
 C o m p o u n d s i n A m b i e n t A i r, C o m p e n d i u m M e t h o d I O 2.1, S a m p l i n g o f A m b i e n t A i r f o r T o t a l S u s p e n d e d
 P a r t i c u l a t e M a t t e r (S P M) a n d P M 10 U s i n g H i g h V o l u m e (H V) S a m p l e r E P A R

H U S E P A b I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 D e v e l o p m e n t C o m p e n d i u m o f M e t h o d s f o r t h e D e t e r m i n a t i o n o f I n o r g a n i c
 C o m p o u n d s i n A m b i e n t A i r, C o m p e n d i u m M e t h o d I O 3.1, S e l e c t i o n, P r e p a r a t i o n a n d E x t r a c t i o n o f F i l t e r
 M a t e r i a l E P A R a u n e

H U S E P A c I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 D e v e l o p m e n t C o m p e n d i u m o f M e t h o d s f o r t h e D e t e r m i n a t i o n o f I n o r g a n i c
 C o m p o u n d s i n A m b i e n t A i r, C o m p e n d i u m M e t h o d I O 3.5, D e t e r m i n a t i o n o f M e t a l s i n A m b i e n t
 P a r t i c u l a t e M a t t e r U s i n g I n d u c t i v e l y C o u p l e d P l a s m a / M a s s (I C P M S) S p e c t r o s c o p y E P A R
 a u n e

H U S E P A a I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 a n d R e l a t e d A s s e s s m e n t s f o r Q u a l i t y A i r M o n i t o r i n g D a t a E P A
 a a n u a r y

H U S E P A b I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 G u i d a n c e f o r R e g u l a t o r y M o d e l i n g A p p l i c a t i o n s E P A R

H U S E P A I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 A s s u r a n c e P r o j e c t P l a n s E P A Q A R M a r c h

H U S E P A I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 A s s u r a n c e P r o j e c t P l a n s E P A Q A E P A R

H U S E P A I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 A i r P o l l u t i o n M e a s u r e m e n t S y s t e m s, V o l u m e I V – M e t e o r o l o g i c a l M e a s u r e m e n t s V e r s i o n 2.0 (F i n a l)
 E P A B M a r c h

H U S E P A v i r l o n m e n t a l E P A Q u a l i t y A s s u r a n c e H a n d b o o k f o r
 A i r P o l l u t i o n M e a s u r e m e n t S y s t e m s, V o l u m e I I A m b i e n t A i r Q u a l i t y M o n i t o r i n g P r o g r a m E P A
 B M a y

H U S E P A I U n i t e d S t a t e s o f E n v i r o n m e n t a l
 I n f o r m a t i o n P u r s u a n t t o t h e C l e a n A i r A c t M a r c h

A p p e n d i x Example Calibration Data Spreadsheets and Operator Checklists



TE

VS

U

G

Customer Co. / Org.	S. H. Bell
Customer Contact	Jim Langbehn
Project No.	17 - 3007
Instrument Model	TE-6070V
ID/ Serial No.	
Instrument Site	S4
Sample ID	
VFC G Factor	0.0251890900

Date	
Technician Initials	
Location	Chicago, IL
Sample Start Date	
Sample End Date	
Service	Sample
Filter Number	

Ambient Conditions Set-up

Temp (deg F) :		Clean Filter P	
Ta (deg F) 5.5		Barometric Press (in Hg) :	
Ta (deg C) 1.7.8		Pa (mm Hg) :	0.0

Ambient Conditions Sample

Temp (deg F) :		Loaded Filter P	
Ta (deg F) 5.5		Barometric Press (in Hg) :	
Ta (deg C) 1.7.8		Pa (mm Hg) :	0.0

Calculate Total Air Volume Using G Factor

Enter Average Temperature During Sampling Duration (Deg F)	
Average Temperature During Sampling Duration (Deg K)	255.22
Enter Average Barometric Pressure During Sampling Duration (in Hg)	
Average Barometric Pressure During Sampling (mm Hg)	0.00
Enter Clean Filter Sampler Inches of Water	
Enter Dirty Filter Sampler Inches of Water	
Average Filter Sampler (mm Hg)	# DIV/ 0!
Enter Total Runtime in Hours (xx. xx)	

Po/ Pa # DIV/ 0!

Calculated Flow Rate (n# DIV/ 0!

Total Flow (n# DIV/ 0!

Calculations

Calibrator Flow (Qa) = 1 / Slope(SQRT(H2 O (Ta/ Pa)) - Intercept)

Pressure Ratio (Po/ Pa) = 1 - Pf/ Pa

% Difference = (Look Up Flow- Calibrator Flow) / Calibrator Flow

NOTE: Ensure calibration orifice has been certified within 60 days

C

I

A

S

OH

M

A

C



G F

Customer Co. / Org.	S. H. Bell
Customer Contact	Jim Langbehn
Project No.	17 - 3007
Instrument Model	TE- 6070 V
ID/ Serial No.	P10244 BL
Instrument Site	S4
VFC G Factor	0.0251890900

Date	March 1, 2017
Technician Initials	
Location	Chicago, IL
Time of arrival	8:00
Time of departure	17:00
Service	Calibration

Ambient Conditions			
Temp (F)	44.2	BP (in Hg)	28.94
Ta (° K)	280	Pa (mm Hg)	734.3
Ta (° C)	6.8		

Calibration Orifice	
Make	Tisch
Model	TE- 5028 A
Serial # :	3303
Qa Slope (m) :	0.93771
Qa Int (b) :	0.00061
Calibration Due Date	03 / 01 / 17

Calibration Information							
Run Number	Orifice " H ₂ O	Qa n ₃ / min	Sampler " H ₂ O	Pf mm Hg	Calculated Po/ Pa	% of n ₃ / min	% of Diff
1	1.50	0.806	2.80	5.226	0.993	188	47.42
2	1.50	0.806	3.30	6.159	0.992	186	47.30
3	1.50	0.806	3.40	6.345	0.991	186	47.17
4	1.40	0.778	4.70	8.771	0.988	182	51.91
5	1.40	0.778	6.00	11.198	0.985	178	51.27

Calculate Total Air Volume Using G Factor	
Enter Average Temperature During Sampling Duration (Deg F)	62.00
Average Temperature During Sampling Duration (Deg K)	289.67
Enter Average Barometric Pressure During Sampling Duration (In Hg)	29.40
Average Barometric Pressure During Sampling (mm Hg)	746.76
Enter Clean Filter Sampler Inches of Water	13.30
Enter Dirty Filter Sampler Inches of Water	14.00
Average Filter Sampler (mm Hg)	25.47
Enter Total Runtime in Hours (xx. xx)	24.00
Po/ Pa	0.966
Calculated Flow Rate (m ³ / min)	7.2
Total Flow (m ³)	87.68

Calculations

$$\text{Calibrator Flow (Qa)} = 1 / \text{Slope} (\text{SQRT} (\text{H}_2\text{O} (\text{Ta} / \text{Pa})) - \text{Intercept})$$

$$\text{Pressure Ratio (Po/ Pa)} = 1 - \text{Pf} / \text{Pa}$$

$$\% \text{ Difference} = (\text{Look Up Flow} - \text{Calibrator Flow}) / \text{Calibrator Flow}$$

NOTE: Ensure calibration orifice been certified within 12 months of use

C

A

CH

S

I

A p p e n d i x Example Chain of Custody Form



IML Air Science
555 Absaraka
Sheridan, WY 82801
(307) 674-7506
www.imlairscience.com

Particulate Sampler Field Envelope

Network _____

Sampler ID _____

Filter Number _____

Sample Date _____

Time Off _____

Time On _____

Run Time _____

Tech. _____

P_{STG}

ΔP on	ΔP off

units

Comments:

A p p e n d i x (3 day) Sampling Schedule, 2017

EPA Sampling Schedule

2017

Important Dates

Notes

3-Day schedule is shown in orange, green, and purple

6-Day schedule is shown in green and purple

12-Day schedule is shown in purple

January

S	M	T	W	T	F	S
1	2	3	4	5	6	
8	9	10	11	12	13	14
15	16	17	18		20	21
22	23	24	25	26	27	28
29	30					

February

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23		25
26	27	28				

March

S	M	T	W	T	F	S
			1	2	3	4
5	6	7		9	10	11
12	13	14	15	16	17	18
19		21	22	23	24	25
26	27	28	29	30	31	

April

S	M	T	W	T	F	S
2	3	4	5	6	7	8
9	10	11	12		14	15
16	17	18	19	20	21	22
23	24		26	27	28	29
30						

May

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18		20
21	22	23	24	25	26	27
28	29	30				

June

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11		13	14	15	16	17
18	19	20	21	22	23	
25	26	27	28	29	30	

July

S	M	T	W	T	F	S
						1
2	3	4	5		7	8
9	10	11	12	13	14	15
16	17		19	20	21	22
23	24	25	26	27	28	29
30	31					

August

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

S	M	T	W	T	F	S
					1	2
3		5	6	7	8	9
10	11	12	13	14	15	
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9		11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

November

S	M	T	W	T	F	S
			1	2		4
5	6	7	8	9	10	11
12	13	14		16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

December

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

A p p e n d i x B S i t i n g P l a n



January

United States Environmental Protection Agency Region
 Air and Radiation Division
 Attn: Katherine Owens, NEPCO Lead
 George T. Zermfalk, EPA
 Wackson Blvd
 Chicago IL

RE: S.H. Bell Company
 10218 South Avenue O
 Chicago, Illinois 60617
 Response to: Request to Provide Information Pursuant to the
 Clean Air Act
 Appendix B, PM₁₀ Monitors and Siting
 Proposed Monitoring Sites and Locations

Dear Ms. Owens

S.H. Bell is pleased to submit this response to provide information pursuant to the Clean Air Act, Appendix B, Monitors and Siting.

PM₁₀ MONITORS AND SITING

Appendix B

Question: Within days of receipt of this request, S.H. Bell is submitting monitoring site locations for FEM real time PM monitoring and Federal Reference Method monitoring at the facilities and proposed monitoring sites.

Response: A site location and type of monitoring proposed for FEM real time PM monitoring are shown on Figures 1 and 2. Historical wind rose data is included in Attachment 1.

Appendix B

Question: Within days of receipt of this request, S.H. Bell is submitting the property lines of the facility and proposed locations of monitoring sites.

Response A site location map of the South Bell
Illinois and the Duncan Industrial
industrial properties is attached for FEM real time PM monitoring
shown on Figure

MONITORING SITE SELECTION RATIONALE

South Bell has selected four proposed monitoring
monitoring locations are identified. The South Bell
meteorological tower denoted as PMS and the
HPS PS PS and the monitoring sites PS
monitoring sites PS will also have FEM based monitoring
will also have FEM based monitoring to the existing
existing meteorological tower

Probe siting information and site information for
accordance with CFR Part 106.10. The S.B.
particular attention is given to the following sections

- Horizontal and Vertical Placement
Microscale PPM and PPMs are required to have
and meters above ground level

The probe or at least perpendicular to the
or horizontally away from support structure
away from dusty or dirty process area
is located near the side of building
of the building relative to the pollutant
concentration potential for the pollutant being

- Spacing From Obstructions
 - a Buildings and other obstructions may
restrict airflow for any pollutant. To avoid
percent of the monitoring area
from obstacles. The distance from
must be at least twice the height of the
monitoring path. An exception may be
taken in street canyons or areas where
are unavoidable
 - b Generally a probe or monitoring path
undesirable because air moving past the
mechanisms. A probe inlet should be
of at least degrees. Wind direction
season of greatest pollutant concentration
of meters of separation from obstructions
site placement

Table E 4 of Appendix E to Part 58 —Summary of Probe and Monitoring Path Siting Criteria (in particular Notes 3, 4, 5, and 8).

Pollutant	Scale (maximum monitoring path length, meters)	Height from ground to probe, inlet or 80% of monitoring path 1 (meters)	Horizontal and vertical distance from supporting structures 2 to probe, inlet or 90% of monitoring path1 (meters)	Distance from trees to probe, inlet or 90% of monitoring path 1 (meters)	Distance from roadways to probe, inlet or monitoring path 1 (meters)
SO ₂	Middle Neighborhood Urban and Regional	1 m 1 km			
CO	Micro Downtown or street canyon sites Micro Linear road sites Middle Neighborhood	1 m 1 km			for areas or street canyon micro scales for micro scales See Table E-1 appendix for middle and neighborhood scales
OB	Middle Neighborhood Urban and Regional	1 m 1 km			See Table E-1 appendix for scales
NO ₂	Micro Near road	1 m 1 km			for micro scales
	Middle	1 m 1 km	Horizontal		
	Neighborhood Urban and Regional	1 m 1 km			See Table E-1 appendix for other scales
Ozone prec H for PAMS	Neighborhood and Urban	1 m 1 km			See Table E-1 appendix for scales
PM _{2.5} PbB	Micro Middle Neighborhood Urban and Regional	1 m 1 km	Micro Linear road Horizontal other	Horizontal distance	See Figure E-1 for all other scales

N	A	Not applicable
---	---	----------------

B. Monitoring path for open path the analysis is applied to all applicable for monitoring

B When probe is located on surface of the web at a distance of

B Should be greater than and must be from the top of the pile to the depth of the obstruction

Distance from sample center to the obstacle is a big hindrance
obstacle protrudes above the sample not meeting the
see text 1

B Must have unrestricted air flow and a degree of exposure to the atmosphere.

B The probe is a small test should be made from materials such as furnace or incinerator.

distance is dependent on the height of the chimney as shown in the figure of the fuel.

B For micro scale CO monitors
B Collocated monitors must be within

least meter apart for sampling to ensure that the results are representative of the entire area.

approved by the Regional Administrative Unit pursuant to section of

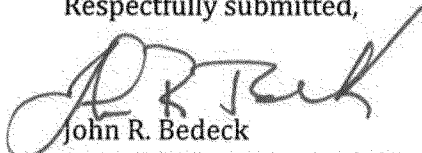
SUMMARY

S.H. Bell looks forward to USEPA's review and approval of responses to Appendix B questions 2 and 3 and to installing, operating, and maintaining ambient monitoring sites at the facility upon your approval of the proposed plan. Should you have any questions about the proposed monitoring locations, please let me know.

CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck
Project Manager & Dir. Of Quality
S.H. Bell Company

Prepared by:
Consolidated Analytical Systems, Inc.

Figure
 Site Location and Vicinity Map
 S H Bell FAYETTEVILLE Chicago South Illinois



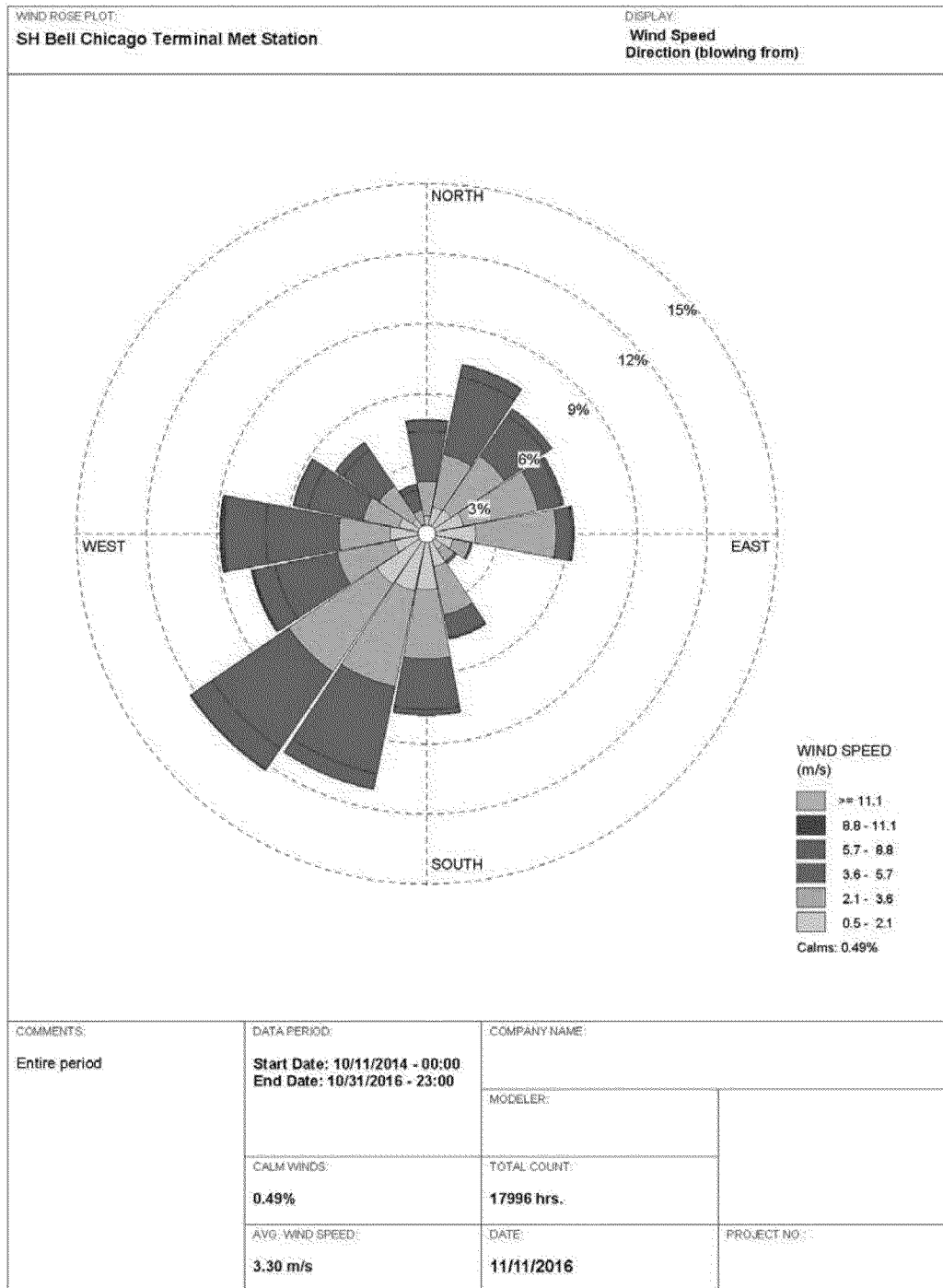
Figure
Proposed and Existing Monitoring Locat
S H Bell Facility South Av



S i t e I D	L a t i t u d e	L o n g i t u d e
P S		
P S		
P S		
P S		
E M S		

Attachment Historical Wind Rose Data SH Bell Facility

October South Av





January 18, 2017

United States Environmental Protection Agency, Region 5

Air and Radiation Division

Attn: Nicole Cantello (Cantello.nicole@epa.gov), George T. Czerniak, and R5enforcement@epa.gov

77 W. Jackson Blvd

Chicago, IL 60604

**RE: S.H. Bell Company
10218 South Avenue O
Chicago, Illinois 60617
Response to January 12, 2017 Email Request to Provide
Justification for Monitor Site Selection**

Dear Ms. Cantello:

S.H. Bell is pleased to submit this response to USEPA Region Air and Radiation Division's Request for clarifications to proposed monitoring site selection dated January 12, 2017. This response addresses questions posed in your email "S.H. Bell Company Chicago S. Avenue O Terminal - Monitoring and Siting" dated January 12, 2017.

Question: Could you provide a justification for your choice of location for each monitor site?

Response: The monitoring locations proposed were selected with two goals in mind: 1) meet USEPA siting criteria (40 CFR Part 58, Appendix E), and 2) collect data that provides an accurate representation of particulate matter (PM) concentrations across the site, with respect to predominant wind direction. The predominant wind direction in the vicinity of the site is from southwest to northeast – see attached Site Location Maps and historical wind rose data from October 2014 – October 2016. Proposed Site 1 (PS1) is proposed to be located at the southwesternmost (upwind) of the property in order to determine concentrations of PM that may be entering the site from offsite sources. The site is surrounded by industrial properties along the Calumet River. PS4 is proposed for the northeasternmost corner (downwind) of the property to most accurately reflect PM concentrations in air masses leaving the site; thereby helping determine impact to adjacent and surrounding properties and receptors. PS2 is located at the southeast corner of the property nearest adjacent residential areas to measure potential impact to offsite receptors. Site PS3 was selected to provide 360 degrees of data capture given the other three proposed site locations.

Question: We view the location of SH Bell's main office to be a prime siting location and would like to understand why SH Bell did not propose that location. Could you please indicate whether SH Bell considered the main office site (which already has an electricity source) as a siting location for monitors?

Response: The location near the main office does not provide 270 degrees of clearance required to meet USEPA siting criteria. Additionally, several trees are located in this area and would require removal. The height of the trees and their effective drip line of the trees that are present both on and off SH Bell property would adversely affect air flow, which violates USEPA siting criteria. Also, a building is located near the main office building which would adversely affect representative air flow from reaching the inlet to the PM monitor.

Question: Did SH Bell consider a site between the two buildings on the southern facility border? EPA's preference would be to merge the two monitors on the southern border and locate one monitor there, and to use the main office location as the site for one FRM monitor and one FEM monitor.

Response: Please see response to #1 above. Based on site characterization and historical wind rose data, SH Bell believes the most representative locations to monitor PM concentrations in air mass entering and exiting the site are at locations PS1 and PS4. The location on the southern property boundary is also located adjacent to an active rail line; therefore, this location was omitted from consideration as a monitoring site.

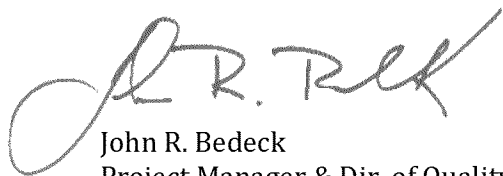
SUMMARY

S.H. Bell looks forward to USEPA's review and approval of responses to questions regarding monitoring site selection. Should you have any additional questions about the proposed monitoring locations, please let me know.

CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "J.R. Bedeck". The signature is fluid and cursive, with a large initial "J" and "R".

John R. Bedeck
Project Manager & Dir. of Quality
S.H. Bell Company

Prepared by:
Consolidated Analytical Systems, Inc.

Figure 1
Site Location and Vicinity Map
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

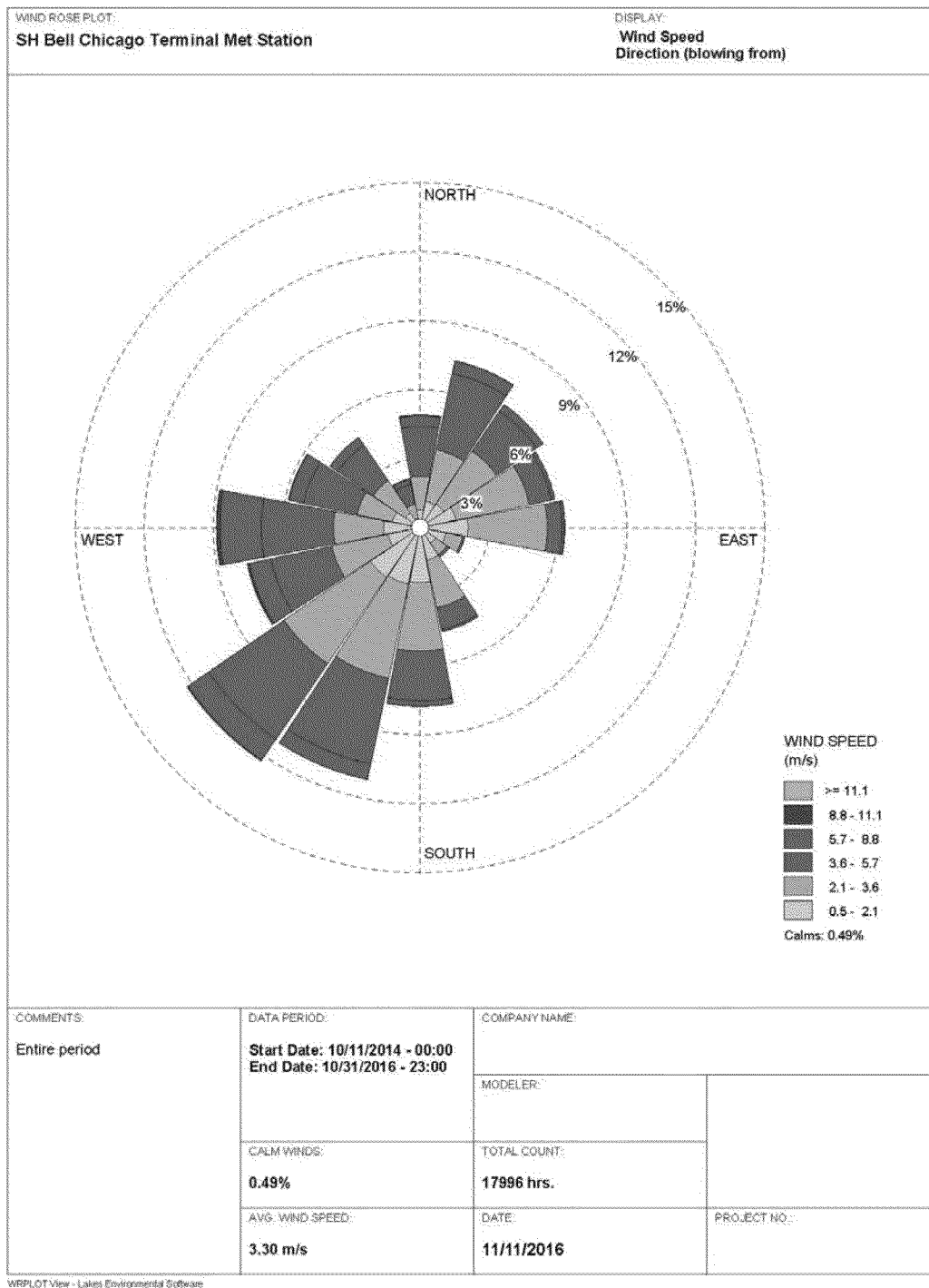


Figure 2
Proposed and Existing Monitoring Locations
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Site ID	Latitude	Longitude
PS1	41.708264	-87.544006
PS2	41.708291	-87.540184
PS3	41.710494	-87.542090
PS4	41.711527	-87.539628
EMS	41.709861	-87.539692

Attachment 1
 Historical Wind Rose Data (October 2014 thru October 2016)
 S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





January 30, 2017

United States Environmental Protection Agency, Region 5

Air and Radiation Division

Attn: Nicole Cantello (Cantello.nicole@epa.gov), George T. Czerniak, and R5enforcement@epa.gov

77 W. Jackson Blvd

Chicago, IL 60604

**RE: S.H. Bell Company
10218 South Avenue O
Chicago, Illinois 60617
Response to January 12, 2017 Email Request to Provide
Justification for Monitor Site Selection**

Dear Ms. Cantello:

Per the conference call between USEPA Region 5 Air and Radiation Division and S.H. Bell on January 25, 2017, S.H. Bell and our contractors have completed an evaluation of the attributes of current Proposed Monitoring Site 2 (PS2) and three additional areas on the S.H. Bell property. Our evaluation is detailed below. Consideration was given to determining if a suitable monitoring site could be installed or developed at each of these sites consistent with USEPA siting criteria guidelines outlined in 40CFR Part 58, Appendix E. Alternatives are named as follows, see attached Figure 1 for locations of the monitoring sites on the S.H. Bell property and Figures 2-5 for site layouts of each of the proposed sites :

1. PS2 is S.H. Bell's original proposed location for PS2
2. PS2.1 is the S.H. Bell site office
3. PS2.2 is an area north of the S.H. Bell high bay
4. PS2.3 is a bulk material storage area located approximately 100 feet west of the S.H. Bell site office. This site was not proposed as a monitoring location by Region 5, but was considered during our original evaluation of proposed site monitoring locations.

PS2.1 (Office Location/Figure 2):

The office location consists of an office trailer, associated parking lot and wooded area. A gravel parking area is located adjacent to the west of the building. The parking area is bound to the west by a vegetated earthen berm. A densely wooded area is located adjacent to the south of the building. The property boundary is located just east of the building. A gated entrance and road deck are adjacent to the north of the office building.

In order to meet the USEPA siting requirements for spacing from obstruction and distance from a road surface, the only potential monitoring location at this site would be to the south of the office building, in the wooded area. S.H. Bell deemed this location unacceptable for several reasons:

1. Clearing of the site and the trees would be difficult due to the size of the trees as well as the location of the trees with respect to the road surface (S Ave N), which is located outside of the S.H. Bell property boundary. Additionally, the time required to complete the tree removal process would likely impact the operational date.
2. Based on the prevailing wind direction from the southwest, into the inlet at this site would have to travel over the vegetated berm located west of the sand office causing uplift of particulate matter, potentially severe enough to travel over the intake of the continuous particulate analyzer.
3. A brick structure is located offsite south of the trees restrict airflow from the primary wind direction.
4. The existing trees act as a vegetative barrier for particle matter exiting the property onto the surrounding receptors.

PS2.2 (North of High Bay/Figure 3)

The high bay is an approximately 40 foot high structure with a parking and a road deck directly to the south, a road deck to the west, the property boundary to the east, trees directly to the north (on and off S.H. Bell property), and a narrow triangular-use storage and parking area to the north.

S.H. Bell could not identify a location that meet the siting requirement for spacing from an obstruction and distance from a road surface. When evaluating this area, several key issues were considered, including:

1. The minimum site location distance from the building is approximately 68' (assuming 2 meter inlet height), assuming no additional obstructions
2. An offsite tree row parallel to S Ave N, runs north from high bay to the facility entrance located near E 101st St. Tree heights in this area range 15 to 25 feet.
3. The exiting road deck runs from the Northwest corner of the high bay to the Northeast. Minimum site location would need to be 2 meters from this road surface.
4. An onsite berm parallel to S Ave N, runs north from high bay to the facility entrance located near E 101st St.

PS2.3 (Bulk Material Storage Area/Figure 4):

The Bulk Material Storage Area location is a material storage area with a road deck directly to the west, a vegetated berm to the east, the S.H. Bell property boundary to the south, and a road deck to the north.

S.H. Bell could not identify a location that meets the siting requirement for spacing from an obstruction and distance from a road surface at this location. When evaluating this area, several key issues were considered, including:

1. The area is regularly used for bulk storage of materials being received, stored, and loaded.
2. The storage piles vary in height, affecting airflow, consistency, and direction
3. No reserved footprint for the siting location is present in the area

PS2 (Initial Proposed PS2/Figure 5):

S.H. Bell maintains the best cardinal point location for a southerly and easterly airflow is represented by the initially proposed PS2.

An additional site evaluation has confirmed this site has several key attributes that exceed minimum siting requirements, including:

1. The road surfaces near the site allow for a minimum clear distance of greater than 2 meters from the road deck located on S.H. Bell property, E 103rd, and S Avenue O.
2. The proposed location is approximately 60' from the nearby building which is approximately 20' high. Assuming a 2 meter inlet height, the site could be located approximately 28' from the building, assuming no additional obstructions.
3. No vegetative (i.e., vegetated berms or trees) or other obstructions are present that are not easily removed. (note: a small vegetative obstruction will be removed along the fence line).

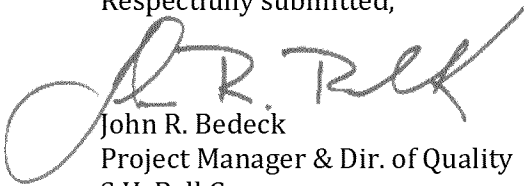
SUMMARY

S.H. Bell looks forward to USEPA's review and approval of responses to questions regarding monitoring site selection. Should you have any additional questions about the evaluation, please let me know.

CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck
Project Manager & Dir. of Quality
S.H. Bell Company

Prepared by:
Consolidated Analytical Systems, Inc.

Figure 1
Proposed Site PS2 Locations
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Figure 2
PS2.1 (Office Area) Site Layout
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





February 6, 2017

United States Environmental Protection Agency, Region 5

Air and Radiation Division

Attn: Nicole Cantello (Cantello.nicole@epa.gov), George T. Czerniak, and R5enforcement@epa.gov

77 W. Jackson Blvd

Chicago, IL 60604

**RE: S.H. Bell Company
10218 South Avenue O
Chicago, Illinois 60617
Response to January 12, 2017 Email Request to Provide
Justification for Monitor Site Selection**

Dear Ms. Cantello:

Per the direction of USEPA Region 5 during the conference call held February 2, 2017 between USEPA Region 5 Air and Radiation Division; The City of Chicago; S.H. Bell; S.H. Bell's counsel, Eckert Seamans Cherin & Mellott, LLC; and S.H. Bell's contractor, Consolidated Analytical Systems, Inc., S.H. Bell and its contractor have completed a re-evaluation of the attributes of alternative Proposed Monitoring Site 2.2 (PS2.2). This re-evaluation was completed because USEPA Region 5 stated that the initially proposed PS2 location was unacceptable for this monitoring program. Key points from our re-evaluation are detailed below. Consideration was again given to determine if a suitable monitoring site could be installed or developed at PS2.2 that would be consistent with USEPA siting criteria guidelines outlined in 40CFR Part 58, Appendix E.

S.H. Bell maintains the best cardinal point location for a southerly and easterly airflow is represented by the initially proposed PS2. However, at the direction of USEPA Region 5 Air and Radiation Division S.H. Bell will move site location PS2 to Region 5's preferred alternative location of PS2.2 even though some deviations from USEPA guidance outlined in 40CFR Part 58, Appendix E will be required. Deviations are listed below in section PS2.2.

Please note, locations PS1, PS3, and PS4 have been deemed acceptable monitoring site locations by USEPA Region 5 and only the location of PS2 is not. See attached Figure 1 for locations of the proposed monitoring sites on the S.H. Bell property and Figures 2-4 for photographs of site attributes at PS 2.2. Alternative locations are named as follows,

1. PS2 is S.H. Bell's original proposed location for PS2
2. PS2.2 is an area north of the S.H. Bell high bay

PS2.2 (North of High Bay/Figure 2)

The high bay is an approximately 40 foot high structure with a parking and a road deck directly to the south, a road deck to the west, the property boundary to the east, trees directly to the

north (on and off S.H. Bell property), and a narrow triangular mixed-use storage and parking area to the north.

S.H. Bell could not identify a location that meets the complete siting requirements for spacing from an obstruction when evaluating this area and it is noted that USEPA will grant an exception to place the FEM instrumentation at this location – see Figure 3 for site features. In an email dated February 2, 2017 from Nicole Cantello at USEPA Region 5 to Eckert Seamens, USEPA Region 5 provided reference to 40CFR Part 58, Appendix E, Set 4 (Spacing from Obstructions) and highlighted the excerpt stating: “An exception to this requirement can be made for measurements taken in street canyons or at source-oriented sites where buildings and other structures are unavoidable.” When placing a monitor at this location, the high bay will be considered an “unavoidable structure.” When evaluating this area, several key issues were considered, including:

1. The minimum site location distance from the building is approximately 68’ (assuming 2 meter inlet height), assuming no additional obstructions. S.H. Bell will place the monitor as far as physically possible from the high bay. However, due to site constraints in this area (detailed below), it may not be possible to place the monitor the full 68’ away.
2. A row of trees bounds the S.H. Bell property to the east. The row of trees is located off of the S.H. Bell property and runs north-south, parallel to S. Ave N, extending from the high bay north to the facility entrance located near E 101st St. Tree heights in this area range 15 to 25 feet.
3. The exiting road deck runs from the Northwest corner of the high bay to the Northeast (see Figure 2). The road is heavily used during business hours, and trucks idle on the nearby scales. Minimum site location would need to be 20 meters from this road surface. S.H. Bell will place the monitor as far away as possible from road deck and truck scales in order to avoid potential influence of particulate matter from the roadway and trucks.
4. Several large (approximately 60 foot high) trees are located adjacent to the north of the high bay building (Figure 4). These trees will need to be removed to site the monitor at PS2.2 without interference from the trees.

Additional Considerations

Following installation and start-up of the monitor, it is anticipated that the concentrations at location PS2.2 are not representative of site conditions due to the influence of airflow around the high bay (based on data collected from the other three monitoring sites). S.H. Bell reserves the right to move location PS2.2 to a more representative monitoring location area along the eastern border of the S.H. Bell property.

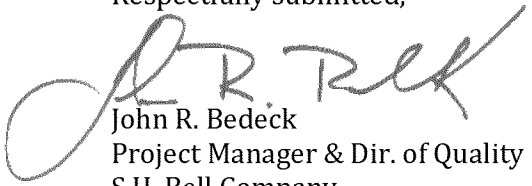
SUMMARY

S.H. Bell looks forward to USEPA’s review and approval of responses to questions regarding monitoring site selection. Should you have any additional questions about the evaluation, please let me know.

CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck
Project Manager & Dir. of Quality
S.H. Bell Company

Prepared by:
Consolidated Analytical Systems, Inc.

Figure 1
Proposed Monitoring Site Locations
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Figure 2
Aerial View of Proposed Site PS2.2 (High Bay) Monitoring Location
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Figure 3
PS2.2 (High Bay) Site Layout
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

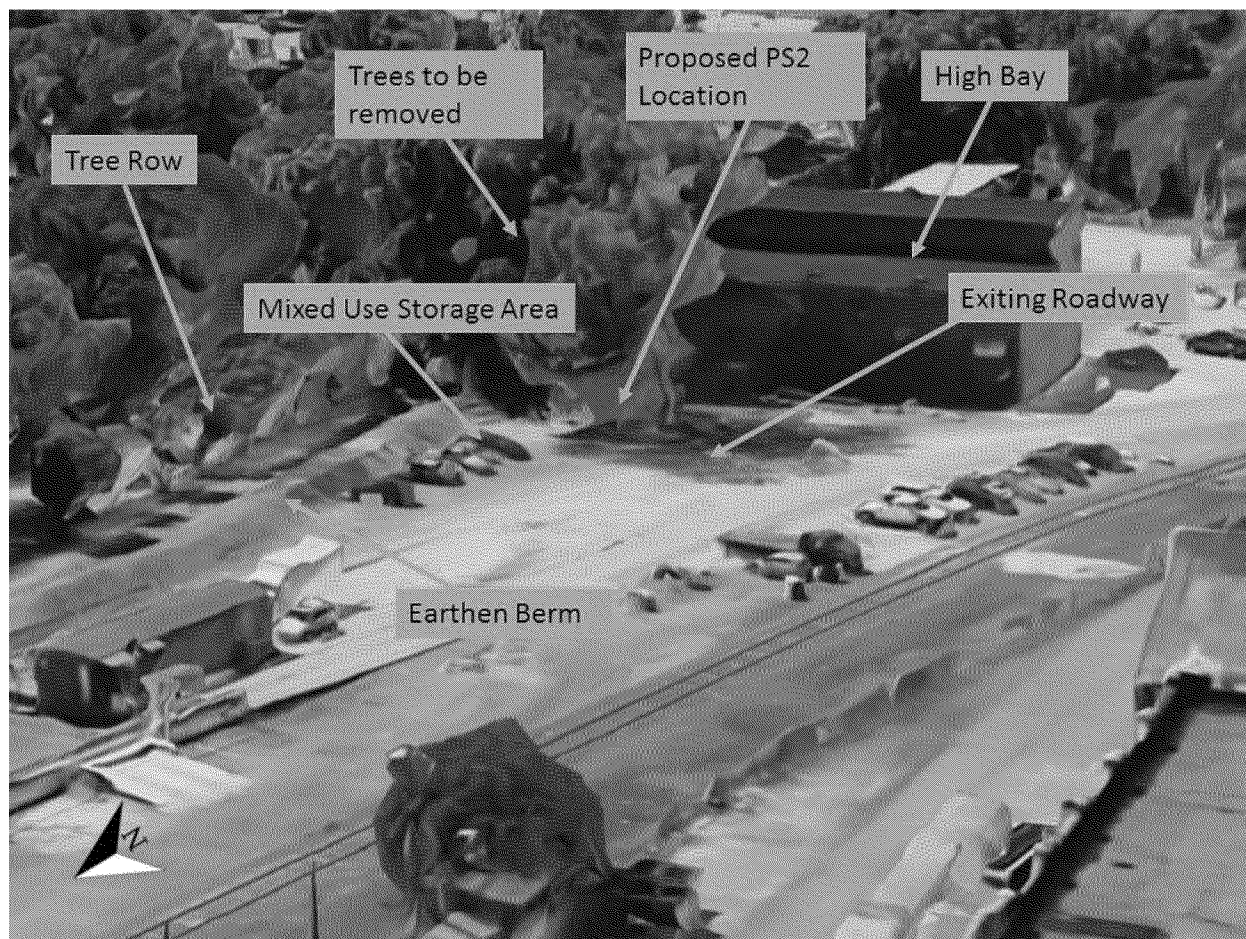


Figure 4
View to West of PS2.2 from S. Ave N on eastern property boundary.
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Note: High Bay building is visible on the left side of the frame

Figure 3
PS2.2 (North of High Bay) Site Layout
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

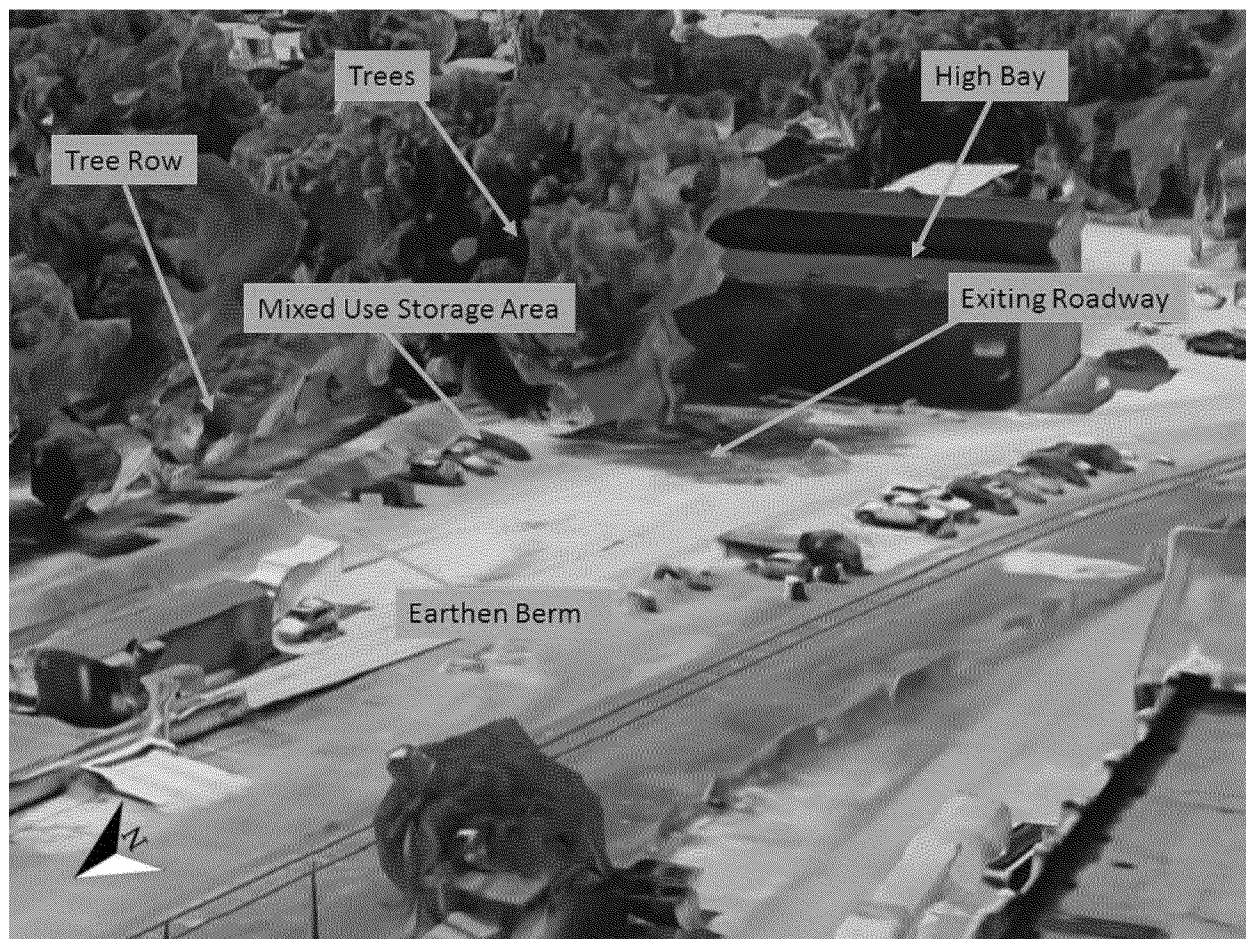


Figure 4
PS2.3 (Bulk Material Storage Area) Site Layout
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Figure 5
PS2 (Initial Proposed PS2) Site Layout
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





February 10, 2017

United States Environmental Protection Agency, Region 5
 Air and Radiation Division
 Attn: Nicole Cantello (Cantello.nicole@epa.gov), George T. Czerniak, and R5enforcement@epa.gov
 77 W. Jackson Blvd
 Chicago, IL 60604

**RE: S.H. Bell Company
 10218 South Avenue O
 Chicago, Illinois 60617
 Response to February 7, 2017 Email Request to Relocate
 Proposed Monitoring Site PS2.2**

Dear Ms. Cantello:

This letter is a response to USEPA Region 5's February 7, 2017 email request to relocate proposed monitoring site PS2.2.

Monitor Location

During the February 2, 2017 conference call between USEPA Region 5, the City of Chicago, and S.H. Bell and its counsel and contractor (Eckert Seamans Cherin & Mellot and CAS, respectively) to discuss the additional proposed PS2 monitoring locations PS2.1, PS2.2, and PS2.3, the following items were discussed in open conversation:

- PS2.1 and PS2.3 were deemed to be unsuitable monitoring locations.
- PS2.2 was determined to be the most suitable monitoring location, even though all USEPA siting criteria conditions (as outlined in 40 CFR Part 58 Appendix B) could not be met. Rationale for seeking exemptions to USEPA siting criteria was reviewed by all parties on the call. USEPA agreed to provide S.H. Bell with additional exemptions to siting criteria to use as rationale for placing the monitor at PS2.2.
- Parties discussed placement of the monitor within the general area of the proposed PS2.2 area.
 - Specifically, the area in the northern portion of the PS2.2 alternative location adjacent to the road deck and weigh station was discussed. After discussion (notably between Mr. Seth Cloran of CAS and Mr. Patrick Miller of USEPA Region 5), this area was determined to be unsuitable due to its proximity to the road deck and weigh station where bulk material haulers (primarily diesel-fuel vehicles) idle.

However, in its February 7, 2017 e-mail correspondence, USEPA Region 5 recommended placement of the monitor within a blue-shaded area in the northern portion of the PS2.2 alternative location adjacent to the road deck and weigh station.

S.H. Bell is seeking clarification regarding USEPA Region 5's intended monitor location. A summary of the rationale for locating PS2.2 in the orange outlined area rather than the blue outlined area identified in USEPA Region 5's email is presented below (see Figure 1 for reference). The western portion of the blue-shaded area would be located close to a road deck and weigh station where bulk material haulers (primarily diesel-fueled vehicles) idle at the approach to the scale house. Having a monitor this close has the potential to influence the monitor as a point source measurement, which would:

- Not be representative of the PM10 concentrations that nearby receptors would be potentially exposed to, and
- Not be representative of the S.H. Bell PM10 contribution to the ambient air mass.
- Additionally, the blue-shaded area identified by USEPA Region 5 in its February 7, 2017 email is currently used as a parking lot for S.H. Bell employees and contractors, and thus, placing the monitor in this location will negatively impact operations of the facility, which makes this area unsuitable as a monitor location.

Further, the eastern portion of the blue-shaded area recommended by USEPA Region 5 is located next to a vegetated berm and tree row (located on S.H. Bell property). These obstacles could potentially generate an inlet aspiration area which could result in PM concentrations which are not representative of the actual S.H. Bell contribution to the particulate in the ambient air mass.

In summary, compounding the deviations from USEPA siting criteria will increase the negative impacts of the efficacy of the data produced from the monitoring locations.

Monitor Platform

During the February 2, 2017 conference call, no mention of placing the monitor on an elevated platform was made. However, in its February 7, 2017 email USEPA Region 5 recommended placing the monitor on a platform. In regards to the request for an "monitor raised on a platform", S.H. Bell contends:

- Placing one (PS2.2) of the four Particulate monitor inlets on a platform with a higher distance from ground level, while the other three approved monitoring locations (PS1, PS3, PS4) are aspirating air at the same relative height from ground level is not advised. S.H. Bell has selected our monitoring locations to provide uniformity across our facility; the placement of one of the particulate monitors on a significantly elevated platform has the potential to negatively influence the uniformity of data being collected by the monitor to determine the source/site contribution to the ambient air mass.

S.H. BELL RECOMMENDATION:

In order to collect the most representative and scientifically defensible data at the S.H. Bell facility, S.H. Bell proposes the particulate monitor at site PS2.2 be placed at an approximate location between 20' and 40' from the northern wall of the High Bay, at a location between 40' and 50' from the centerline of the tree row running north/south on the S.H. Bell property side (west) of S Ave N. To provide uniformity of monitoring stations across the S.H. Bell facility, the monitor at PS2.2 should be placed at the same height from ground level as other monitors at the site.

SUMMARY

S.H. Bell looks forward to USEPA Region 5's clarification on this matter and to beginning monitoring.

INCORPORATION BY REFERENCE

Documentation of discussions held to date regarding monitoring site locations at the S.H. Bell facility are documented below. Previous communications are incorporated by reference.

By way of background, this is USEPA Region 5's fourth request to re-evaluate/re-locate the initially proposed PS2 monitoring site location, which were previously made in a January 12, 2017 e-mail from Nicole Cantello and in conference calls on January 25, 2017 and on February 2, 2017. S.H. Bell has promptly responded to all of USEPA Region 5's requests. Notably, S.H. Bell's February 6, 2017 letter re-evaluated the alternative site location PS2.2 when USEPA stated that the initially proposed PS2 monitoring location was unacceptable as it did not meet its objective for this monitoring program. The initially proposed PS2 monitoring location is the only location that meets all USEPA siting criteria. At the direction of USEPA Region 5 on February 2, 2017 conference call, S.H. Bell evaluated moving the monitor site location PS2 to USEPA Region 5's preferred alternative location of PS2.2 even though multiple deviations from USEPA siting criteria will be required. Notably, the PS2.2 alternative location specified to USEPA in a letter dated January 30, 2017 that was in response to USEPA's request to evaluate alternative locations on the eastern site of the facility.

CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck
Project Manager & Dir. Of Quality
S.H. Bell Company

Prepared by:
Consolidated Analytical Systems, Inc.

Figure 1
Proposed Monitoring Site Location
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





February 14, 2017

United States Environmental Protection Agency, Region 5

Air and Radiation Division

Attn: Nicole Cantello (Cantello.nicole@epa.gov), George T. Czerniak, and R5enforcement@epa.gov

77 W. Jackson Blvd

Chicago, IL 60604

**RE: S.H. Bell Company
10218 South Avenue O
Chicago, Illinois 60617
Letter Update to S.H. Bell's December 30, 2016 Response to:
Request to Provide Information Pursuant to the Clean Air Act
Appendix B, PM₁₀ Monitors and Siting
Proposed Monitoring Sites and Locations**

Dear Ms. Cantello:

S.H. Bell is pleased to submit this update to our December 30, 2016, response to USEPA Region 5 Air and Radiation Division's Request to Provide Information Pursuant to the Clean Air Act dated March 9, 2015. Specifically, this letter report documents the location change for proposed monitoring location PS2 determined during a series of telephone discussions, emails, and letter reports between USEPA Region 5, the City of Chicago, S.H. Bell, S.H. Bell's counsel Eckert, Seamans, Cherin & Mellott, LLC, and S.H. Bell's air monitoring Consolidated Analytical Systems, Inc., as documented below. The final proposed monitoring locations PS2, PS3, and PS4 are shown on Figure 1.

INCORPORATION BY REFERENCE

- 12/30/2016 – S.H. Bell “Response to Request to Provide Information Pursuant to the Clean Air Act, Appendix B, PM₁₀ Monitors and Siting, Proposed Monitoring Sites and Locations”
- 01/11/2017 – USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting” (request for clarification to proposed monitoring site selection)
- 01/18/2017 – S.H. Bell Letter “Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection”
- 01/25/2017 – Conference Call between USEPA Region 5 and S.H. Bell (request for evaluation of PS2, PS2.1, PS2.2, and PS2.3)
- 01/30/2017 – S.H. Bell S. Letter Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection (Response to 01/25/2017 conference call requesting written evaluation of PS2, PS2.1, PS2.2, PS2.3)
- 02/02/2017 – Conference Call between USEPA Region 5, the City of Chicago, S.H. Bell, Eckert Seamans Cherin & Mellot, LLC and Consolidated Analytical Systems, Inc. (request to re-evaluated alternative proposed monitoring site PS2.2)

- 02/06/2017 – S.H. Bell Letter “Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection” (Re-Evaluation of alternative proposed site PS2.2)
- 02/07/2017 - USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting” (request to locate proposed monitoring site PS2.2)
- 02/10/2017 – S.H. Bell Letter “Response to February 7, 2017 Email Request to Locate Proposed Monitoring Site PS2.2”
- 02/13/2017 – USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting” (request to resubmit S.H. Bell siting plan for approval)

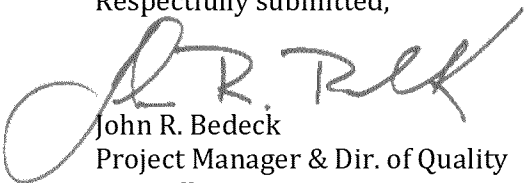
SUMMARY

S.H. Bell looks forward to installing, operating, and ambient monitoring sites at the facility upon your approval of the proposed plan. Should you have any questions about the proposed monitoring locations, please let me know.

CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck
Project Manager & Dir. of Quality
S.H. Bell Company

